MULTI V™

Trouble Shooting Guide Book

LG Electronics Inc.

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R: Reserved

Error code	Page	Error code	Page	Error code	Page	Error code	Page	Error code	Page	Error code	Page	Error code	Page
01	34	41	78	81		121	78	161	81	201	140	241	142
02	34	42	80	82		122	78	162	78	202	140	242	142
03	35	43	80	83	R	123	81	163	78	203	140	243	142
04	36	44	81	84		124	81	164	81	204	141	244	142
05	38	45	81	85		125	124	165	81	205	140	245	142
06	34	46	81	86	108	126	124	166	124	206	140	246	142
07	39	47	78	87	109	127	124	167	124	207	140	247	
08	R	48	81	88		128	80	168	124	208	141	248	R
09	40	49	83	89		129	80	169	72	209	140	249	
10	41	50	84	90		130	81	170	74	210	140	250	143
11	42	51	85	91		131	R	171	130	211	140	251	143
12		52	88	92		132	81	172	83	212	141	252	143
13		53	89	93	R	133	78	173	131	213	140	253	143
14		54	90	94		134	78	174	131	214	140	254	
15		55		95		135	81	175	131	215	140	255	
16	R	56	R	96		136	81	176	131	216	141	256	
17		57		97		137	124	177	131	217	140	257	
18		58		98		138	124	178		218	140	258	
19		59	92	99		139	124	179		219	140	259	
20		60	93	100	66	140	126	180		220	141	260	
21	43	61	R	101	66	141	90	181		221	140	261	
22	51	62	94	102	66	142	111	182		222	140	262	
23	55	63	R	103	66	143	72	183		223	140	263	
24	57	64		104	111	144	74	184		224	141	264	
25	61	65	95	105	113	145	72	185	R	225	140	265	
26	62	66	R	106	115	146	74	186		226	140	266	
27	R	67	96	107	121	147	126	187		227	140	267	R
28	63	68	R	108	R	148	83	188		228	141	268	
29	64	69		109	123	149	126	189		229	140	269	
30	R	70	98	110	90	150	83	190		230	140	270	
31		71	99	111	111	151	127	191		231	140	271	
32	66	72	R	112	R	152	66	192		232	141	272	
33	66	73	100	113	124	153	66	193	132	233		273	
34	72	74	102	114	124	154	57	194	132	234		274	
35	74	75	103	115	124	155	90	195		235		275	
36		76	104	116	80	156	111	196		236	R	276	
37	R	77	105	117	80	157	80	197	R	237		277	
38		78	106	118	81	158	80	198		238		278	
39		79	107	119	R	159	81	199		239		279	

1. Basic Part

LG Electronics Inc.

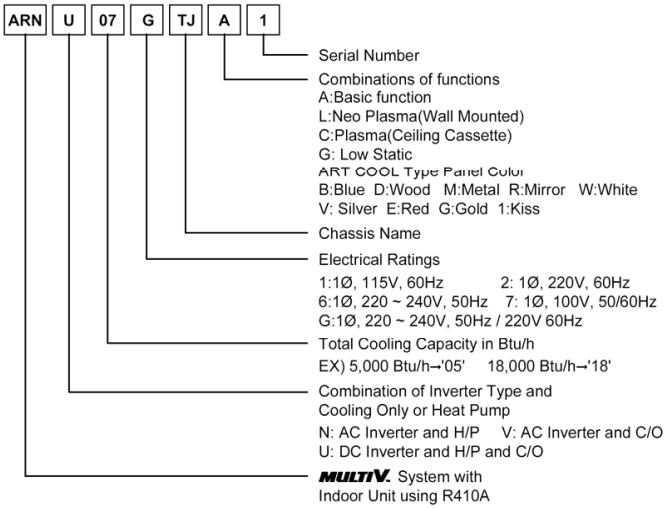
1.1 UNIT CONVERSION

	kcal/h	Btu/h	(US) Rt	(Japan) Rt	kW	HP	Nominal HP
kcal/h	1	3.968	0.0003306	0.0003012	0.001162	0.00155	0.0004
Btu/h	0.252	1	0.0000833	0.0000759	0.000293	0.00039	0.0001
(US) Rt	3,024	12,000	1	0.91	3.57142	4.69	1.251
(Japan) Rt	3,320	13,174.6	1,097	1	3.861	5.149	1.373
kW	860	3.412	0.2843	0.2590	1	1.333	0.3555
HP	640	2,559.5	0.213	0.1942	0.75	1	0.2667
Nominal HP	2,400	9,598.1	0.799	0.728	2.81	3.75	1

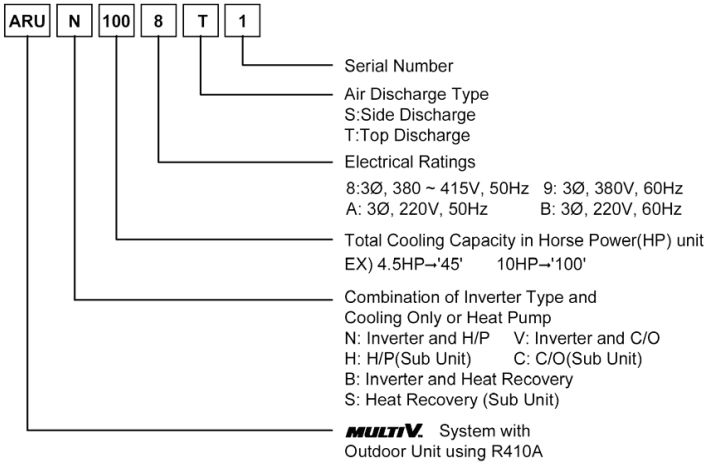
	kgf/cm^2	bar	Pa	atm
kgf/cm^2	1	0.980665	98,066.5	0.9678
bar	1.0197	1	100,000	0.9869
Pa	0.0000102	0.00001	1	0.00001
atm	1.0332	1.01325	101,325	1

1.2 NOMENCLATURE

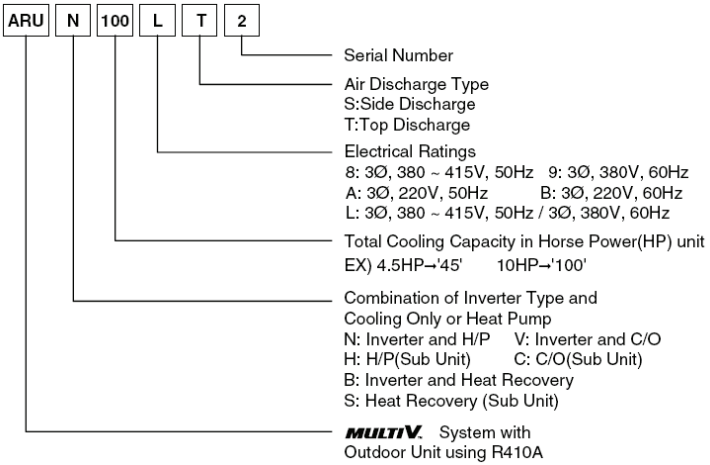
1.2.1 Multi V Indoor Unit (R410A)


ARN U 07 G TJ A 1
Serial Number
Combinations of functions
A:Basic function
L:Neo Plasma(Wall Mounted)
C:Plasma(Ceiling Cassette)
G: Low Static
ART COOL Type Panel Color
B:Blue D:Wood M:Metal R:Mirror W:White
V: Silver E:Red G:Gold 1:Kiss
Chassis Name
Electrical Ratings
1:1Ø, 115V, 60Hz 2: 1Ø, 220V, 60Hz
6:1Ø, 220 ~ 240V, 50Hz 7: 1Ø, 100V, 50/60Hz
G:1Ø, 220 ~ 240V, 50Hz / 220V 60Hz
Total Cooling Capacity in Btu/h
EX) 5,000 Btu/h→'05' 18,000 Btu/h→'18'
Combination of Inverter Type and
Cooling Only or Heat Pump
N: AC Inverter and H/P V: AC Inverter and C/O
U: DC Inverter and H/P and C/O
MULTI V. System with
Indoor Unit using R410A

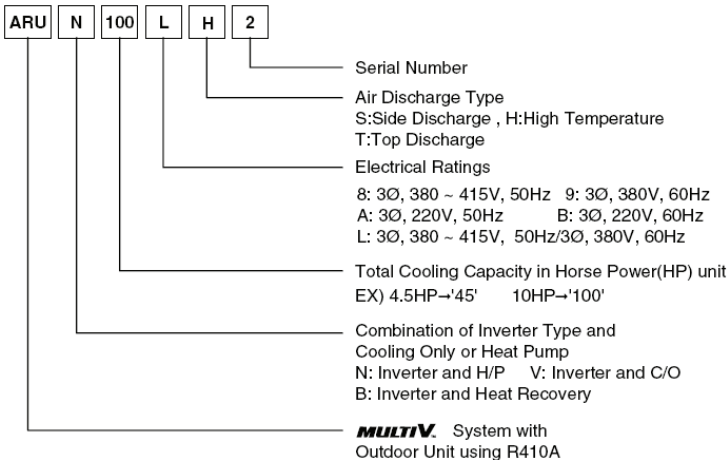
1.2.2 Multi V Plus Outdoor Unit (R410A)


ARU N 100 8 T 1
Serial Number
Air Discharge Type
S:Side Discharge
T:Top Discharge
Electrical Ratings
8:3Ø, 380 ~ 415V, 50Hz 9: 3Ø, 380V, 60Hz
A: 3Ø, 220V, 50Hz B: 3Ø, 220V, 60Hz
Total Cooling Capacity in Horse Power(HP) unit
EX) 4.5HP→'45' 10HP→'100'
Combination of Inverter Type and
Cooling Only or Heat Pump
N: Inverter and H/P V: Inverter and C/O
H: H/P(Sub Unit) C: C/O(Sub Unit)
B: Inverter and Heat Recovery
S: Heat Recovery (Sub Unit)
MULTI V. System with
Outdoor Unit using R410A

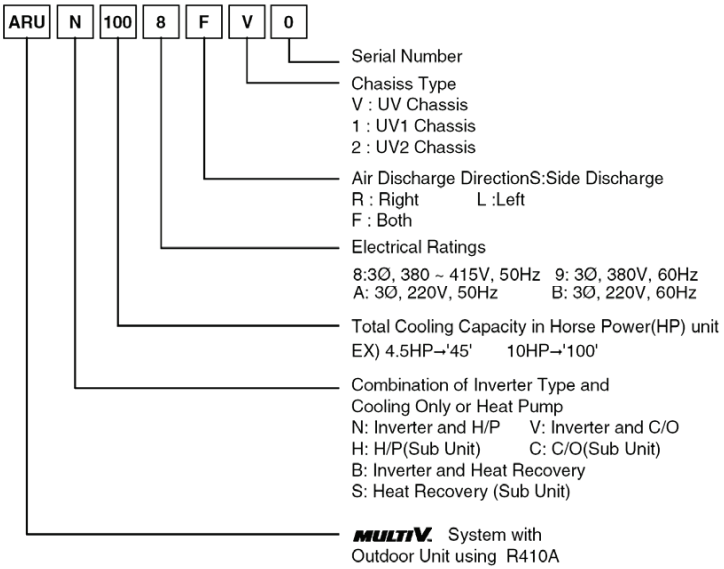
1.2.3 Multi V Plus II Outdoor Unit (R410A)


ARU
N
100
L
T
2
Serial Number
Air Discharge Type
S:Side Discharge
T:Top Discharge
Electrical Ratings
8: 3Ø, 380 ~ 415V, 50Hz 9: 3Ø, 380V, 60Hz
A: 3Ø, 220V, 50Hz B: 3Ø, 220V, 60Hz
L: 3Ø, 380 ~ 415V, 50Hz / 3Ø, 380V, 60Hz
Total Cooling Capacity in Horse Power(HP) unit
EX) 4.5HP→'45' 10HP→'100'
Combination of Inverter Type and
Cooling Only or Heat Pump
N: Inverter and H/P V: Inverter and C/O
H: H/P(Sub Unit) C: C/O(Sub Unit)
B: Inverter and Heat Recovery
S: Heat Recovery (Sub Unit)
MULTI V System with
Outdoor Unit using R410A

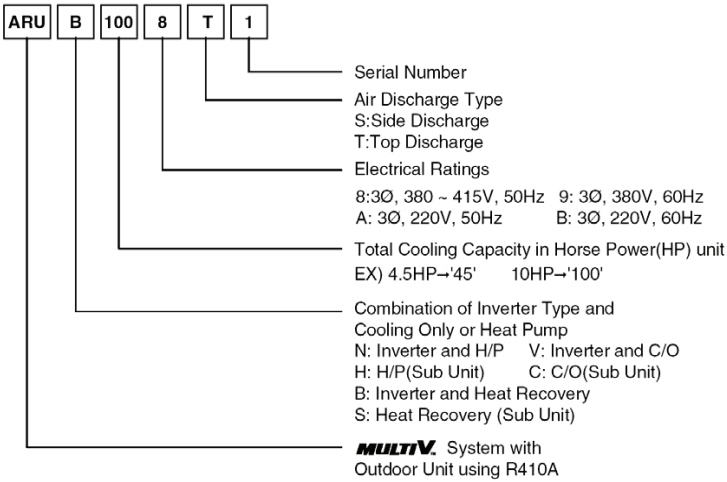
1.2.4 Multi V Plus II Outdoor Unit (R410A)


ARU
N
100
L
H
2
Serial Number
Air Discharge Type
S:Side Discharge , H:High Temperature
T:Top Discharge
Electrical Ratings
8: 3Ø, 380 ~ 415V, 50Hz 9: 3Ø, 380V, 60Hz
A: 3Ø, 220V, 50Hz B: 3Ø, 220V, 60Hz
L: 3Ø, 380 ~ 415V, 50Hz/3Ø, 380V, 60Hz
Total Cooling Capacity in Horse Power(HP) unit
EX) 4.5HP→'45' 10HP→'100'
Combination of Inverter Type and
Cooling Only or Heat Pump
N: Inverter and H/P V: Inverter and C/O
B: Inverter and Heat Recovery
MULTI V System with
Outdoor Unit using R410A

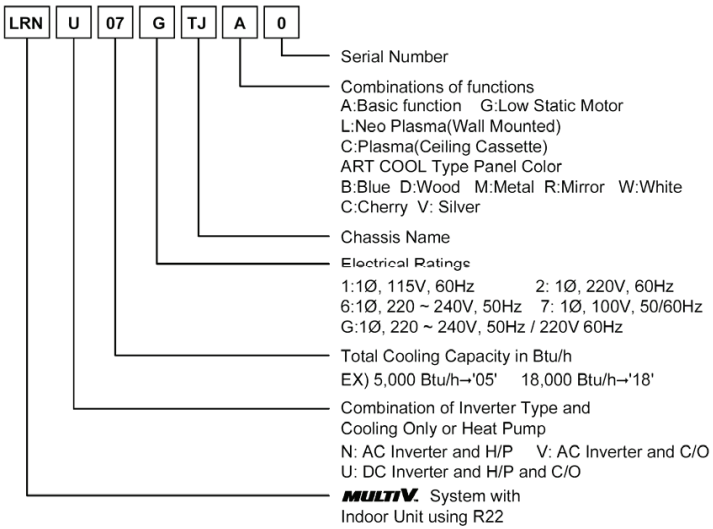
1.2.5 Multi V Space Outdoor Unit (R410A)



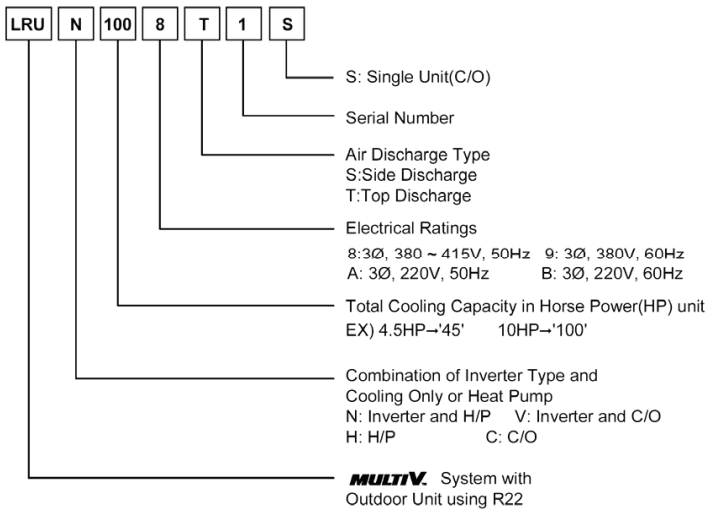
1.2.6 Multi V Sync Outdoor Unit (R410A)



1.2.7 Multi V Indoor Unit (R22)


LRN U 07 G TJ A 0
Serial Number
Combinations of functions
A:Basic function G:Low Static Motor
L:Neo Plasma(Wall Mounted)
C:Plasma(Ceiling Cassette)
ART COOL Type Panel Color
B:Blue D:Wood M:Metal R:Mirror W:White
C:Cherry V: Silver
Chassis Name
Electrical Ratings
1:1Ø, 115V, 60Hz 2: 1Ø, 220V, 60Hz
6:1Ø, 220 ~ 240V, 50Hz 7: 1Ø, 100V, 50/60Hz
G:1Ø, 220 ~ 240V, 50Hz / 220V 60Hz
Total Cooling Capacity in Btu/h
EX) 5,000 Btu/h→'05' 18,000 Btu/h→'18'
Combination of Inverter Type and
Cooling Only or Heat Pump
N: AC Inverter and H/P V: AC Inverter and C/O
U: DC Inverter and H/P and C/O
MULTI V System with
Indoor Unit using R22

1.2.8 Multi V Plus Outdoor Unit (R22)


LRU N 100 8 T 1 S
S: Single Unit(C/O)
Serial Number
Air Discharge Type
S:Side Discharge
T:Top Discharge
Electrical Ratings
8:3Ø, 380 ~ 415V, 50Hz 9: 3Ø, 380V, 60Hz
A: 3Ø, 220V, 50Hz B: 3Ø, 220V, 60Hz
Total Cooling Capacity in Horse Power(HP) unit
EX) 4.5HP→'45' 10HP→'100'
Combination of Inverter Type and
Cooling Only or Heat Pump
N: Inverter and H/P V: Inverter and C/O
H: H/P C: C/O
MULTI V System with
Outdoor Unit using R22

1.3 LGMV Guideline

No	Item	Unit	R22,407C	Abnormal condition	410A	Abnormal condition	Cause & Check Point
1	High Pressure	kPa	1100~1800	above 2200	2000 ~ 3000	above 3200	Overcharging(30Hz),Fan Lock Overchaning(25Hz:Plus II)
				below 900		below 1800	Ref. Leakage or Ref. Shortage
2	Low Pressure (Cooling)	kPa	300~500	above 600	600 ~ 1000	above 1300	Overcharging
				below 250		below 400	Ref. Leakage or Ref. Shortage
3	Indoor LEV	Pulse	200~600	above 1000	200~600	above 1000	Ref. Leakage or Ref. Shortage
				below 200		below 200	Overcharging
4	Outdoor LEV	Pulse	1944	-	1344	-	Full Open
5	Indoor pipe [Outlet-inlet]	℃	above 0℃	below -1℃	above 0℃	below -1℃	Overcharging
							LEV fault
6	Indoor pipe Inlet,Outlet	℃	8℃~15℃	above 17℃	6℃~15℃	above 17℃	Ref. Leakage,
							Indoor Path. Clogging
7	High Pressure (Heating)	kPa	1600~2000	above 2300	2500 ~ 3200	above 3300	Overcharging
							Fan Lock
				below 1400		below 2300	Ref. Leakage or Ref. Shortage
8	Low Pressure	kPa	200~600	above 800	200 ~ 1200	above 1200	LEV fault
				below 120		below 120	Ref. Leakage or Ref. Shortage
9	Indoor LEV	Pulse	800~1900	-	200~1350	-	Pipe Inlet/outlet Subcooling control
10	Outdoor LEV	℃	300~1600 (100~400)	below 200	200~800	below 200	Overcharging
				above 1800		above 1000	Ref. Leakage or Ref. Shortage
11	Discharge pipe - Tb(condense)	℃	above 15℃	below 15℃	above 17℃	below 17℃	Overcharging
							LEV fault
12	Comp. Discharge T.	℃	60~100	above 110℃	60~100	above 110℃	Ref. Leakage or Ref. Shortage
				below 50℃		below 50℃	LEV fault
13	Suction Superheat	℃	above 0.5℃	below 0℃	above 0.5℃	below 0℃	Liquid compression, Overcharging
				above 7℃		above 7℃	Ref. Leakage or Ref. Shortage
14	DC Link voltage(Plus II)	V	above 380V	Below 320V			Inv. PCB fault,
				Above 700V			Voltage sensor fault

- The pressure is relative value.
- The operation ratio of indoor unit is not less than 80% and the value of above table is measured at stable state with LGMV
- The value of above table is not absolute and can be changed according to operation status or installation environment
- The causes of above table are representative and another cause also can exist.

1.4 Temperature vs. pressure of ref.

Saturation temperature vs. saturation pressure table for each refrigerant

Absolute pressure = Guage pressure + 101.325 kPa

kPa = kgf/cm2 X 101.97

R-22	
Temp.	Relative Pressure
℃	kPaG
-30	62.56
-25	100.11
-20	143.99
-15	194.87
-10	253.46
-5	320.48
0	396.66
5	482.78
10	579.62
15	687.99
20	808.69
25	942.59
30	1090.55
35	1253.46
40	1432.25
45	1627.89
50	1841.36
55	2073.75
60	2326.16
65	2599.83
70	2896.07

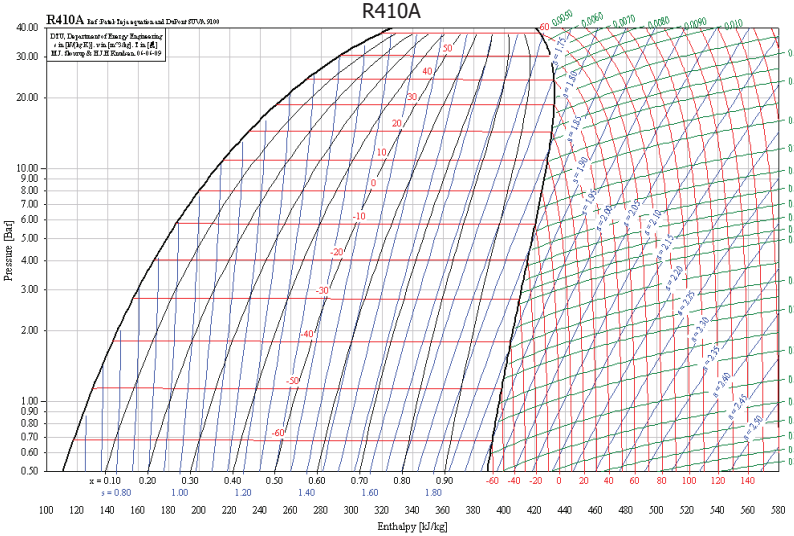
R-407C					
Temp.	Relative pressure(kPaG)		Relative pressure	Temp.(℃)	
℃	Saturated Liquid	Saturated Gas	kPaG	Saturated Liquid	Saturated Gas
-30	86.75	37.87	50	-35.26	-28.35
-25	129.50	72.67	100	-28.52	-21.75
-20	179.43	113.92	150	-22.99	-16.34
-15	237.28	162.41	200	-18.25	-11.71
-10	303.86	218.96	250	-14.09	-7.64
-5	378.98	284.43	350	-6.98	-0.69
0	466.50	359.72	400	-3.87	2.35
5	564.29	445.77	500	1.71	7.78
10	674.25	543.56	600	6.63	12.57
15	797.30	654.12	750	13.09	18.85
20	934.41	778.51	850	16.94	22.59
25	1086.55	917.87	1000	22.17	27.67
30	1254.72	1073.36	1150	26.91	32.24
35	1439.97	1246.28	1300	31.23	36.42
40	1643.37	1437.87	1550	31.23	36.42
45	1866.04	1649.67	1750	42.42	47.18
50	2109.14	1883.24	2000	47.78	52.30
55	2373.87	2140.33	2250	52.69	56.97
60	2661.51	2422.98	2550	58.09	62.08
65	2973.36	2733.60	2850	63.05	66.74
70	3310.77	3075.22	3200	68.38	71.69

R-410A					
Temp.	Relative pressure(kPaG)		Relative pressure	Temp.(℃)	
℃	Saturated Liquid	Saturated Gas	kPaG	Saturated Liquid	Saturated Gas
-30	169.62	168.91	170	-30.09	-30.02
-25	229.70	228.81	230	-25.08	-25.01
-20	299.57	298.46	300	-20.06	-19.99
-15	380.23	378.87	380	-15.09	-15.01
-10	472.75	471.09	470	-10.21	-10.12
-5	578.21	576.21	580	-4.98	-4.89
0	697.76	695.38	700	0.04	0.13
5	832.60	829.77	830	4.86	4.96
10	983.94	980.63	980	9.84	9.94
15	1153.09	1149.25	1150	14.88	14.98
20	1341.39	1336.98	1350	20.18	20.29
25	1550.25	1545.26	1550	24.96	25.08
30	1781.19	1775.59	1800	30.36	30.47
35	2035.78	2029.59	2000	34.30	34.42
40	2315.76	2309.03	2300	39.71	39.82
45	2623.00	2615.82	2600	44.62	44.73
50	2959.61	2952.13	2950	49.84	49.95
55	3328.02	3320.49	3400	55.91	56.01
60	3731.18	3724.00	3700	59.61	59.70
65	4173.11	4166.98	4200	65.28	65.34
70	4746.09	4706.31	4700	70.17	70.17

1.5 P-h Diagram

R22

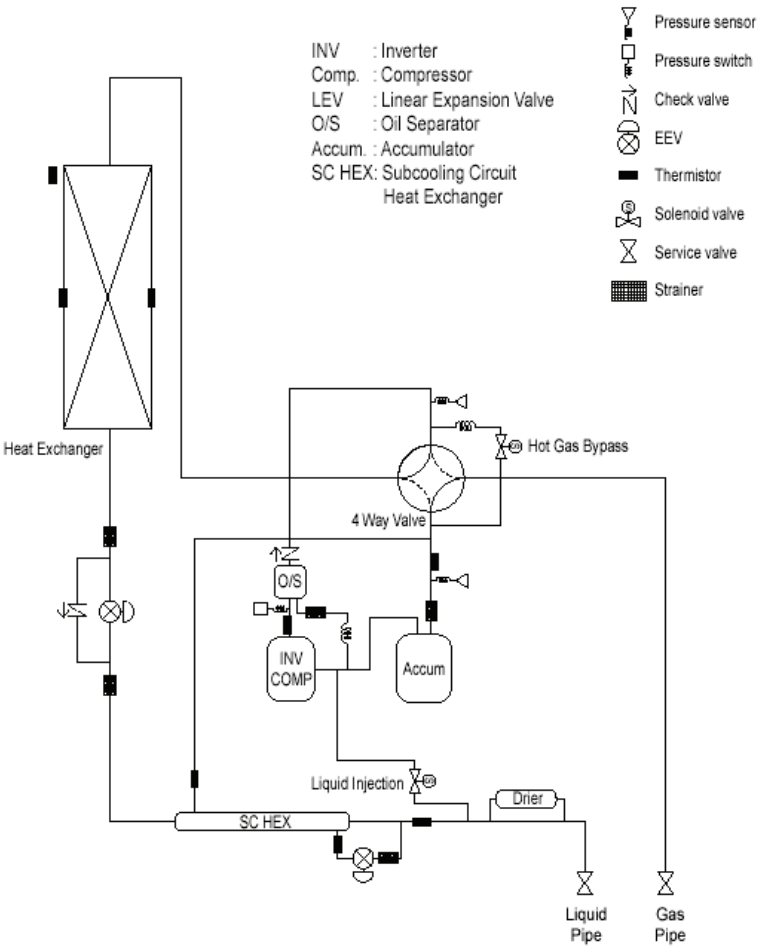
R410A



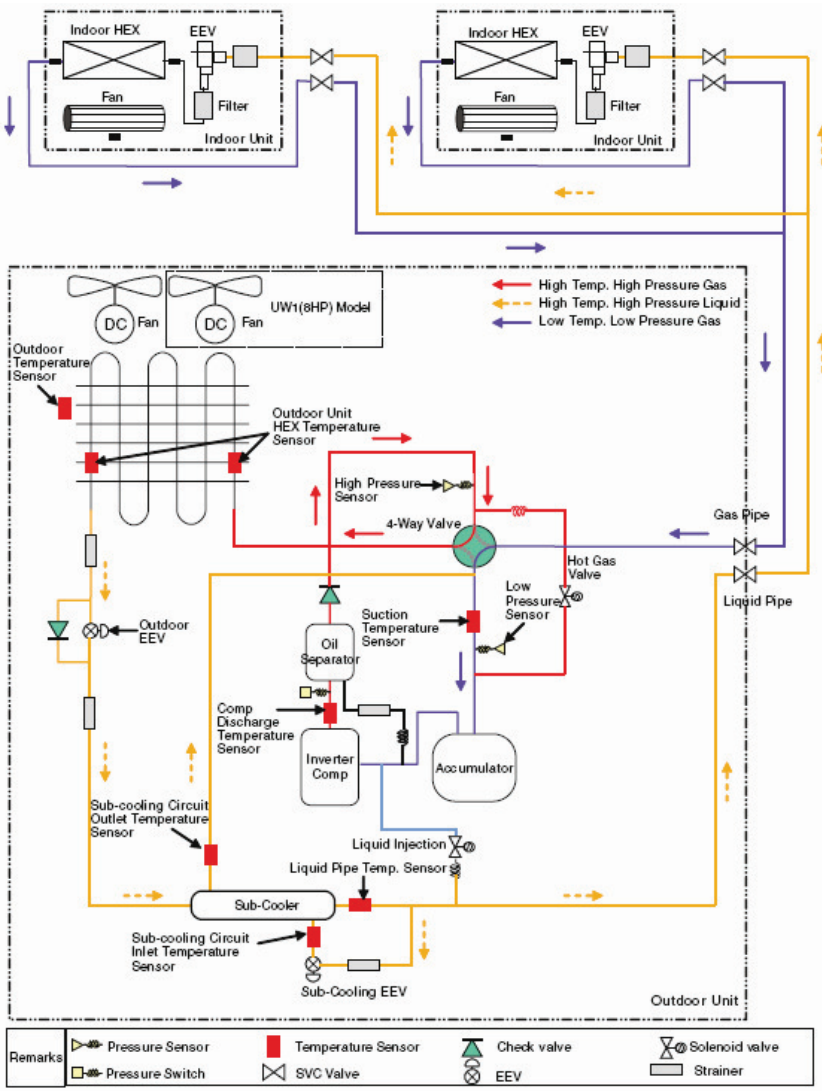
1.6 Cycle Circuit & Sensor

1.6.1 Multi V Plus, Plus II

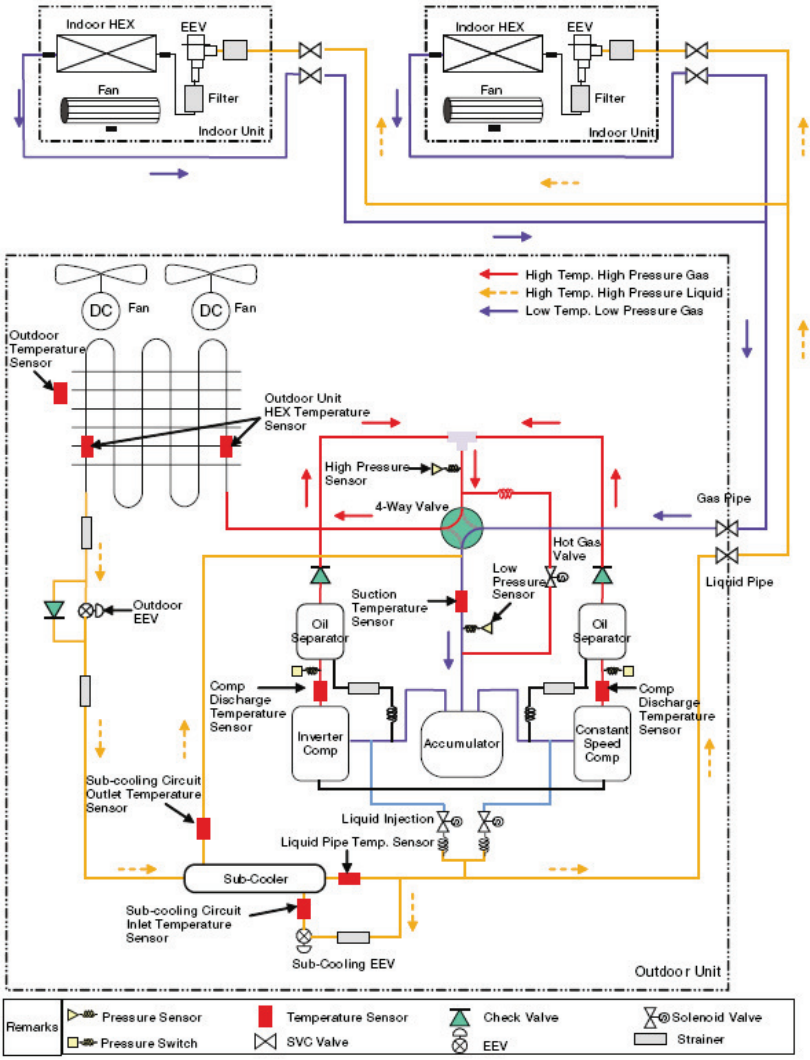
1.6.1.1 Main Outdoor Unit(5/6 HP)



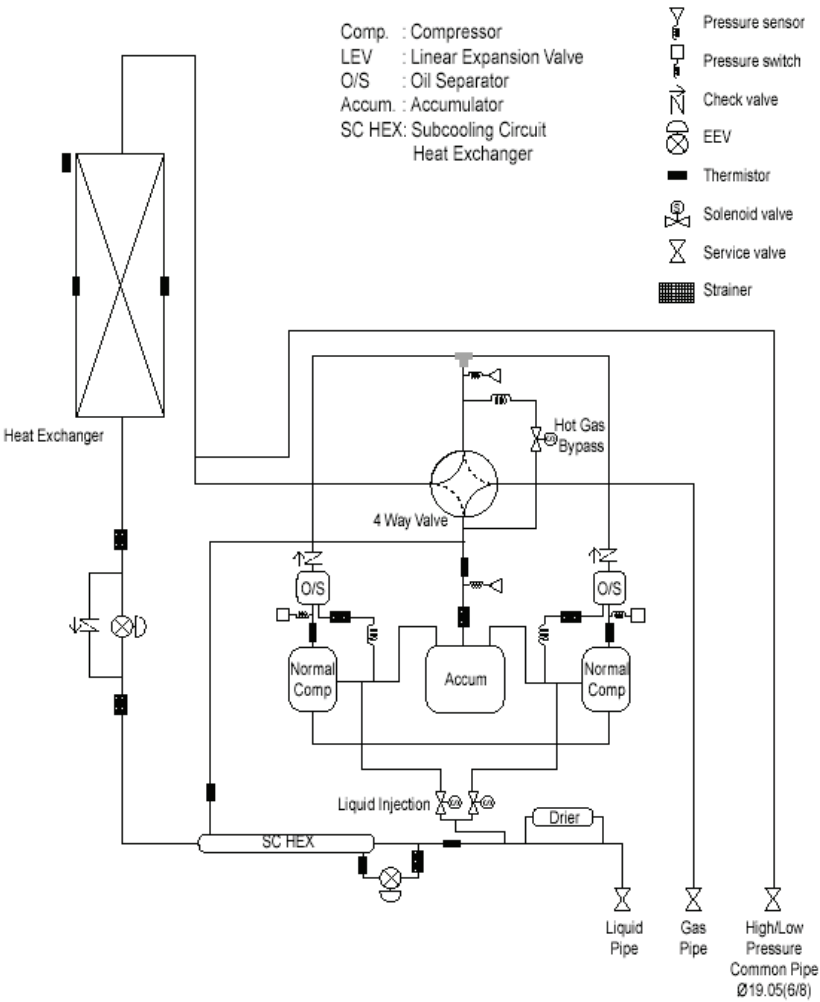
1.6.1.2 Main Outdoor Unit (Plus II 8HP)



1.6.1.3 Main Outdoor Unit (Plus 8~14HP, Plus II 10~16HP)

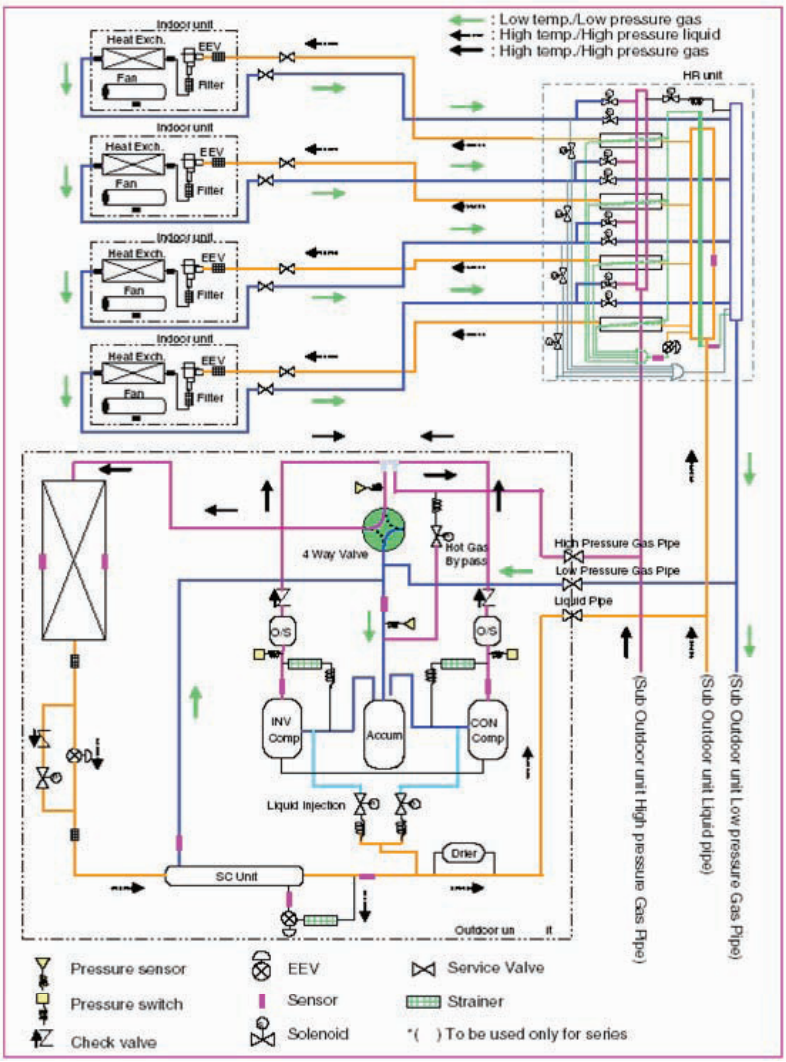


1.6.1.4 Sub Outdoor Unit (Plus 8/10/12/14 HP)

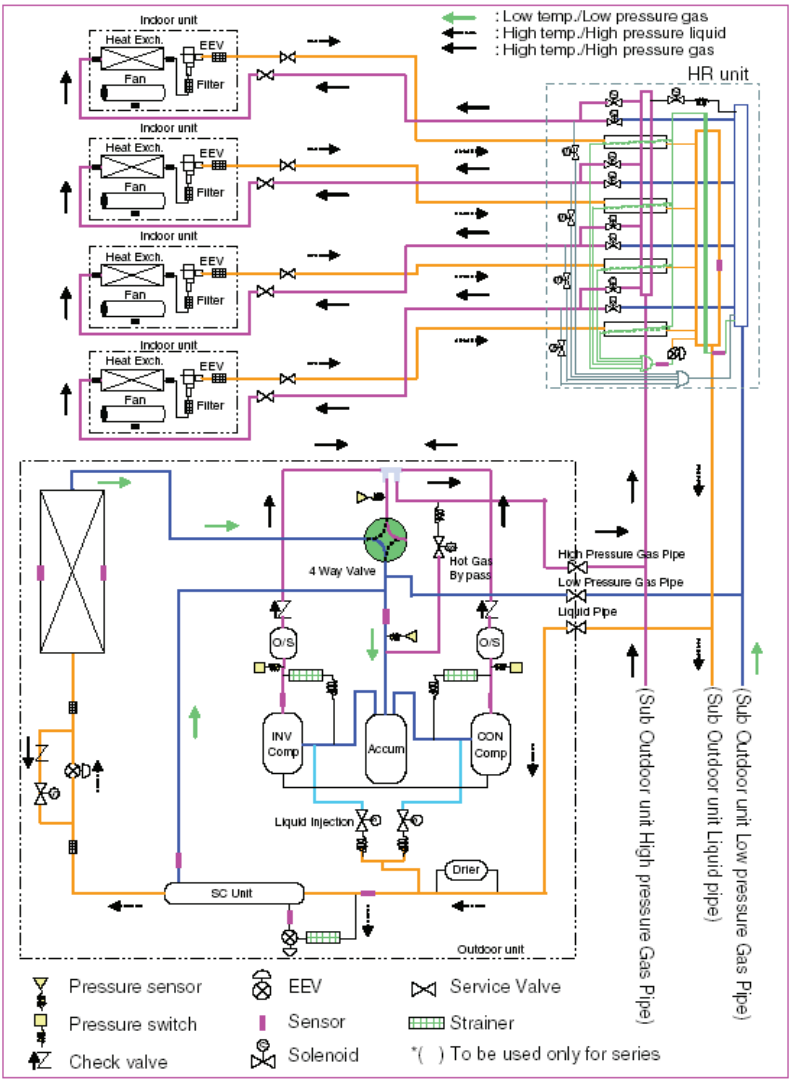


1.6.2 Multi V Sync

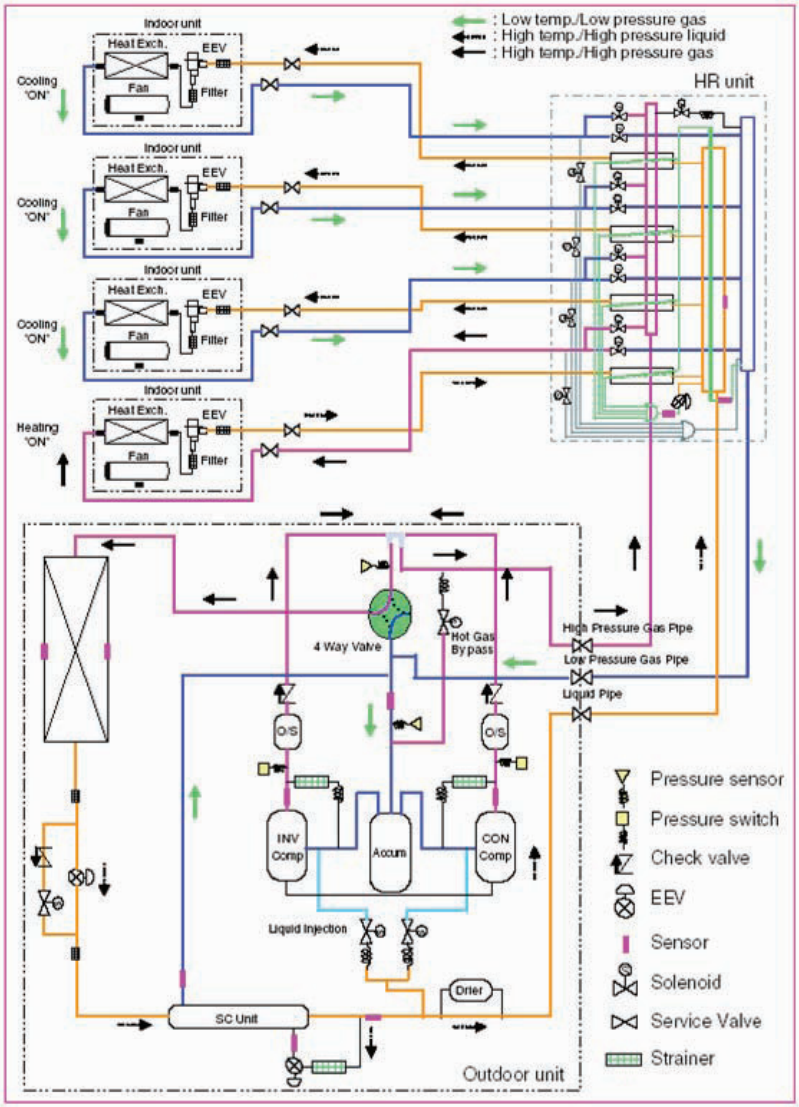
1.6.2.1 Cooling Mode



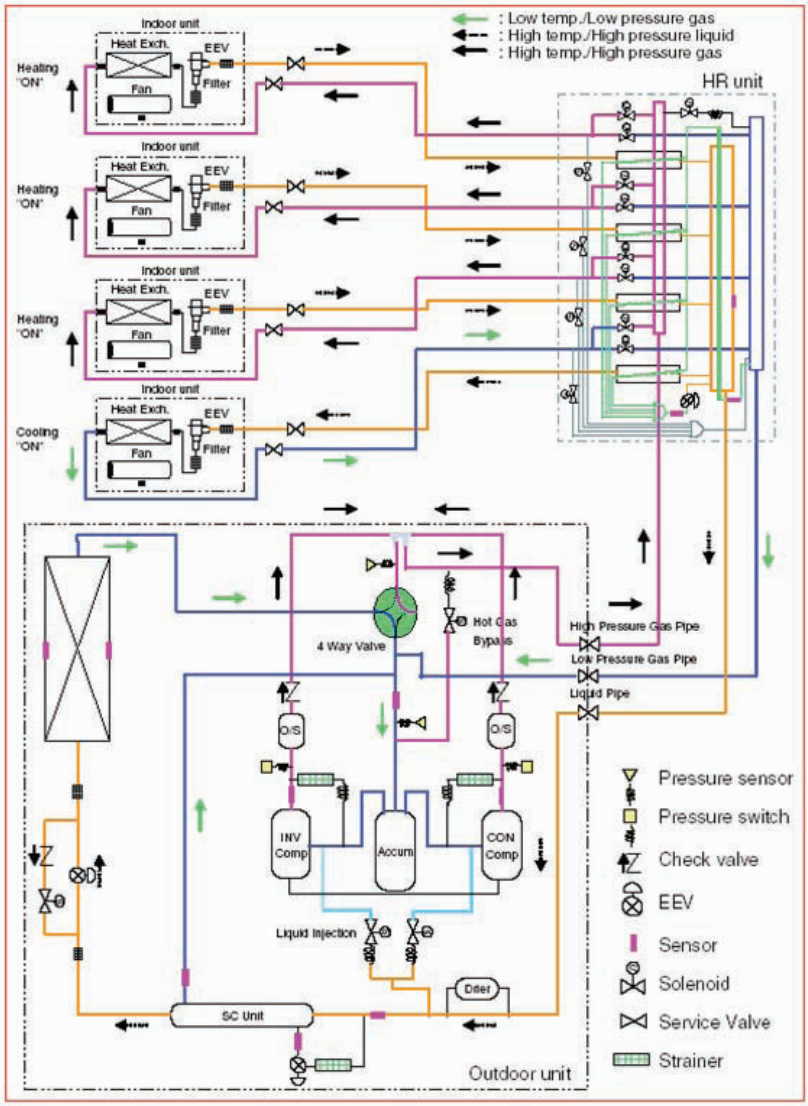
1.6.2.2 Heating Mode



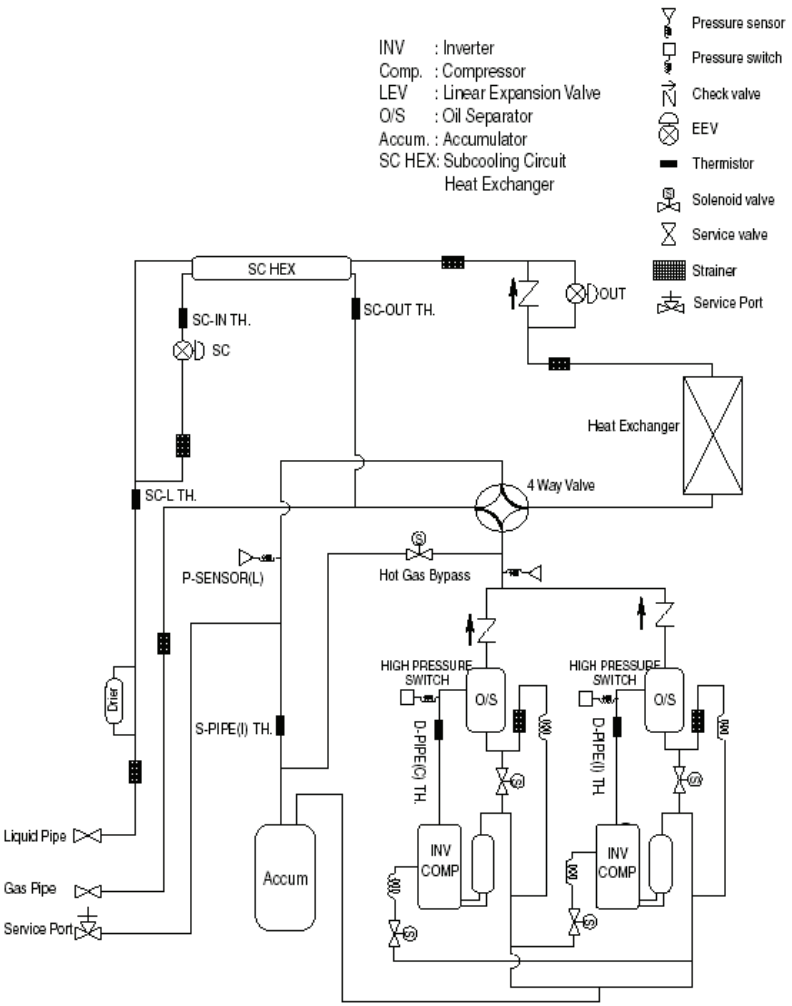
1.6.2.3 Cooling Oriented Simultaneous Operation



1.6.2.4 Heating Oriented Simultaneous Operation



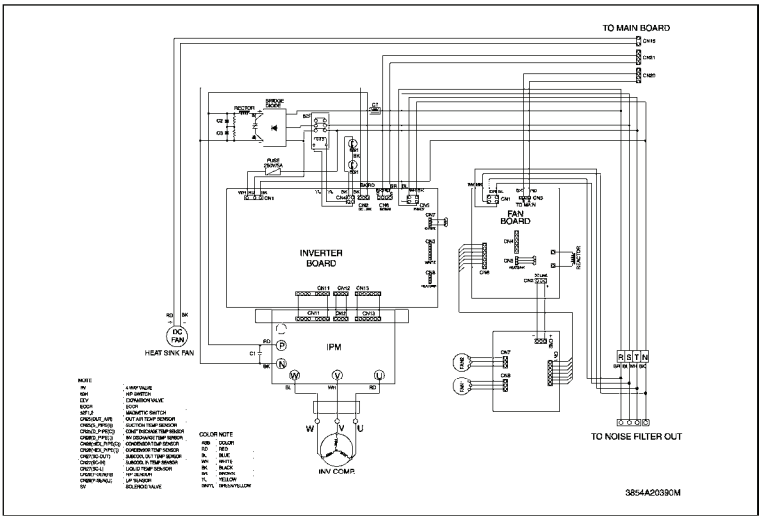
1.6.3 Multi V Space (10HP)

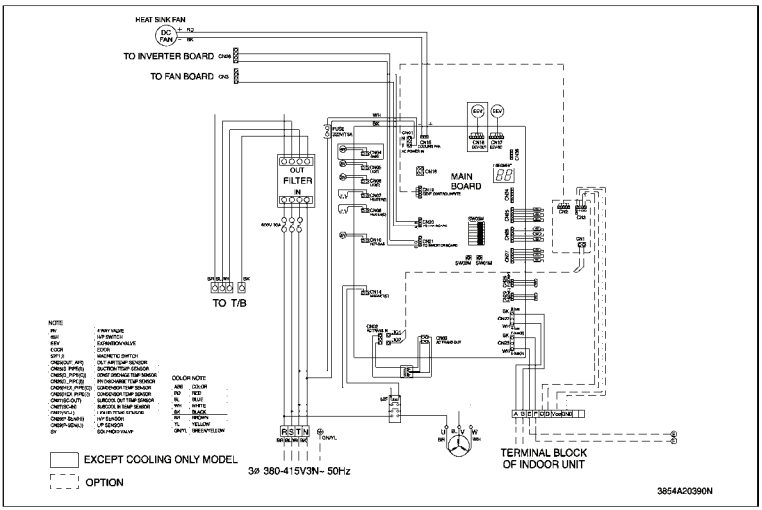


1.. Outdoor Wiring Diagram

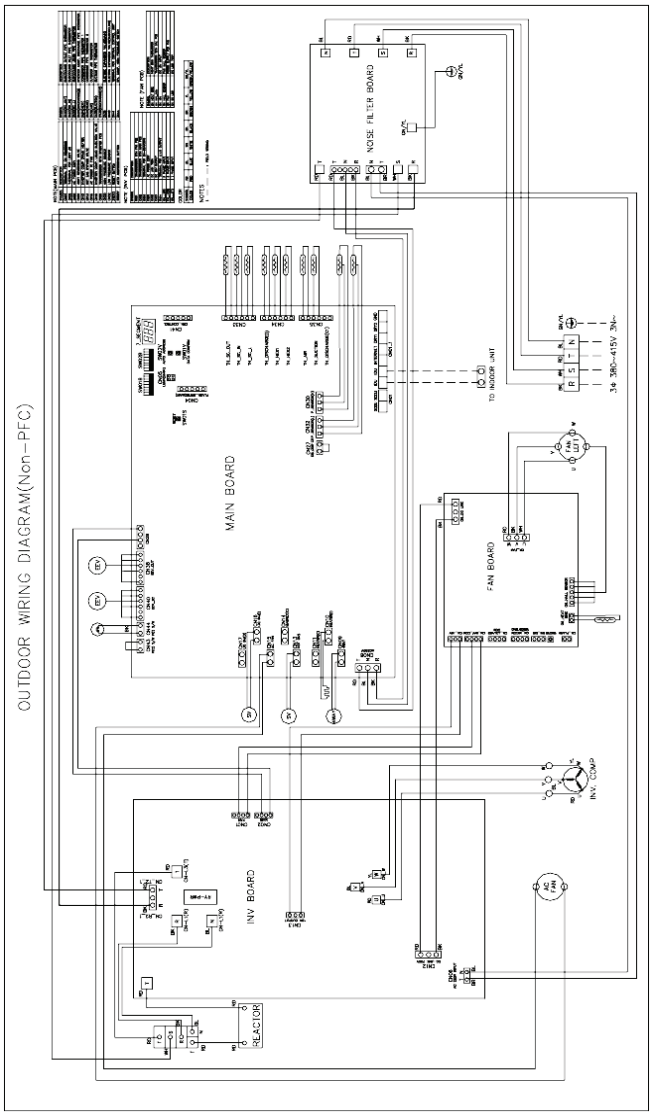
1.7.1 Multi V Plus

1.7.1.1 Multi V Plus Main Unit

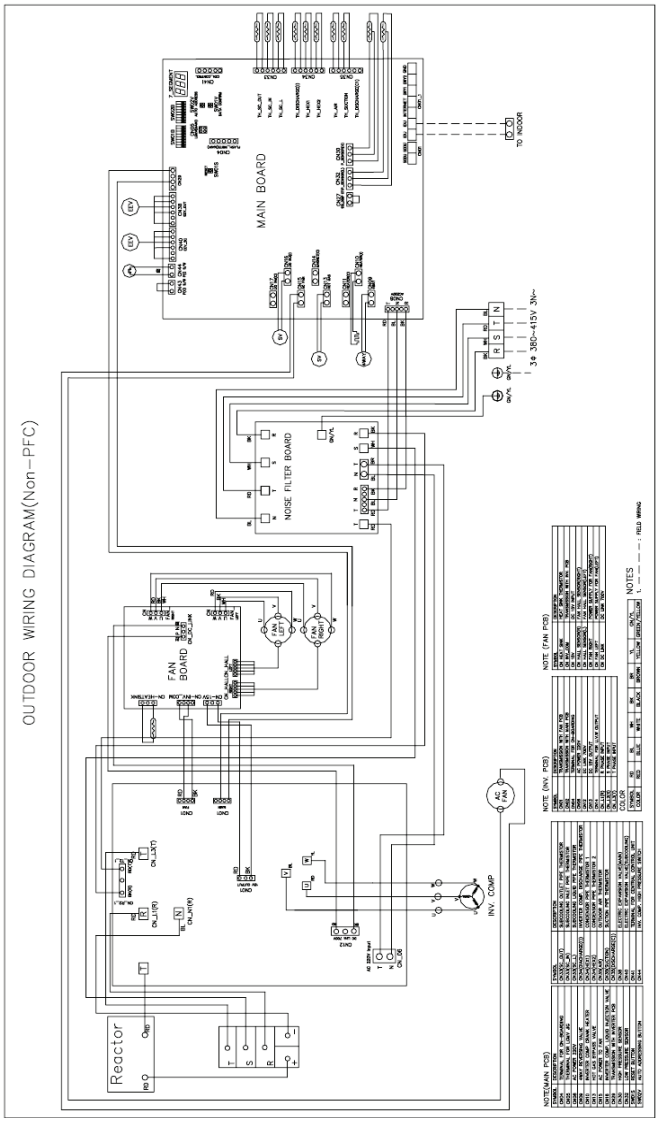




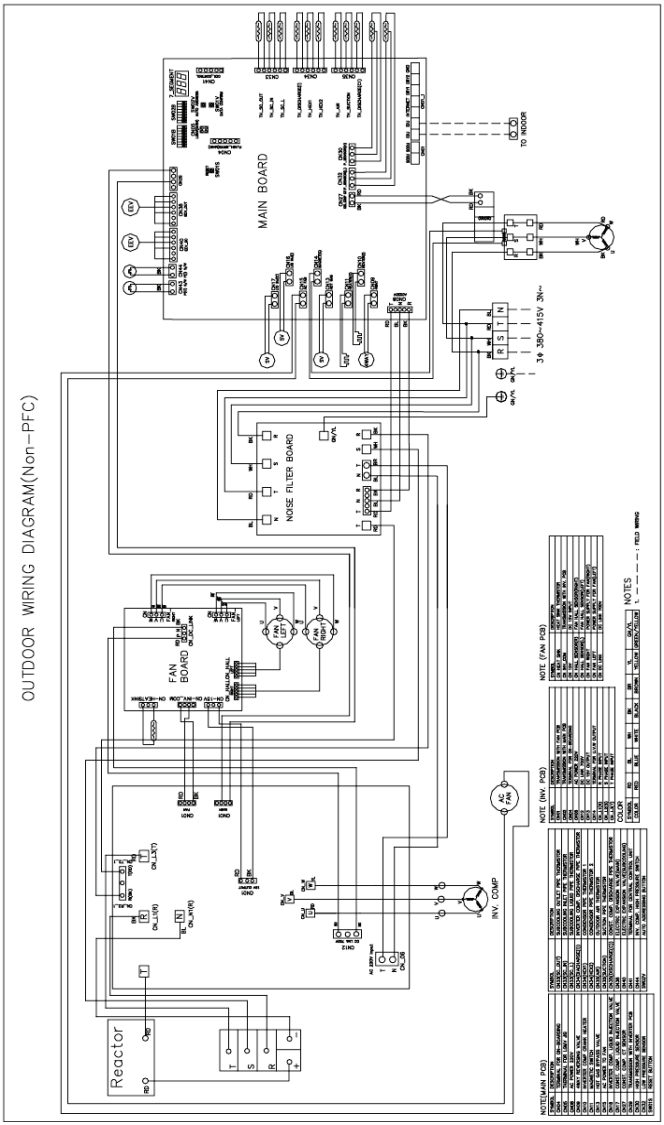
1.7.1.2 Multi V Plus II Sub 5,6HP(UY2)



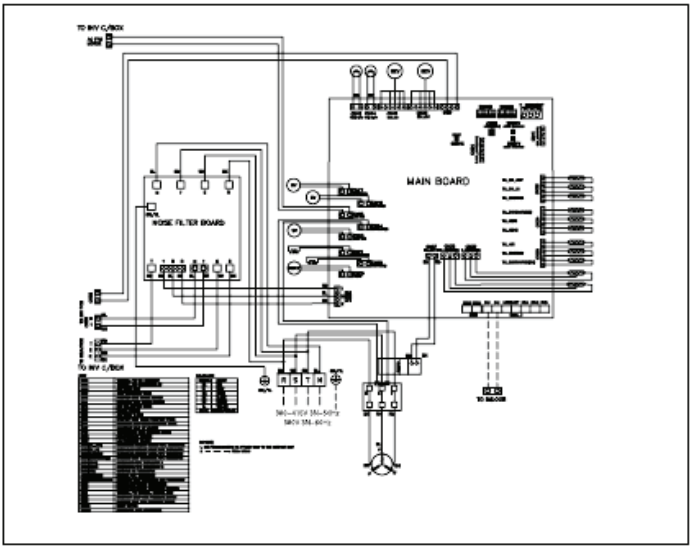
1.7.1.3 Multi V Plus II 8HP(UW1)

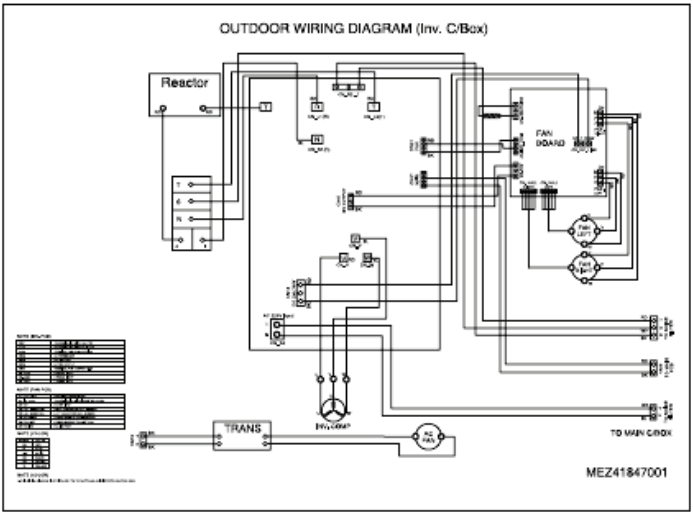


1.7.1.4 Multi V Plus II 10,12,14,16HP(UW1)

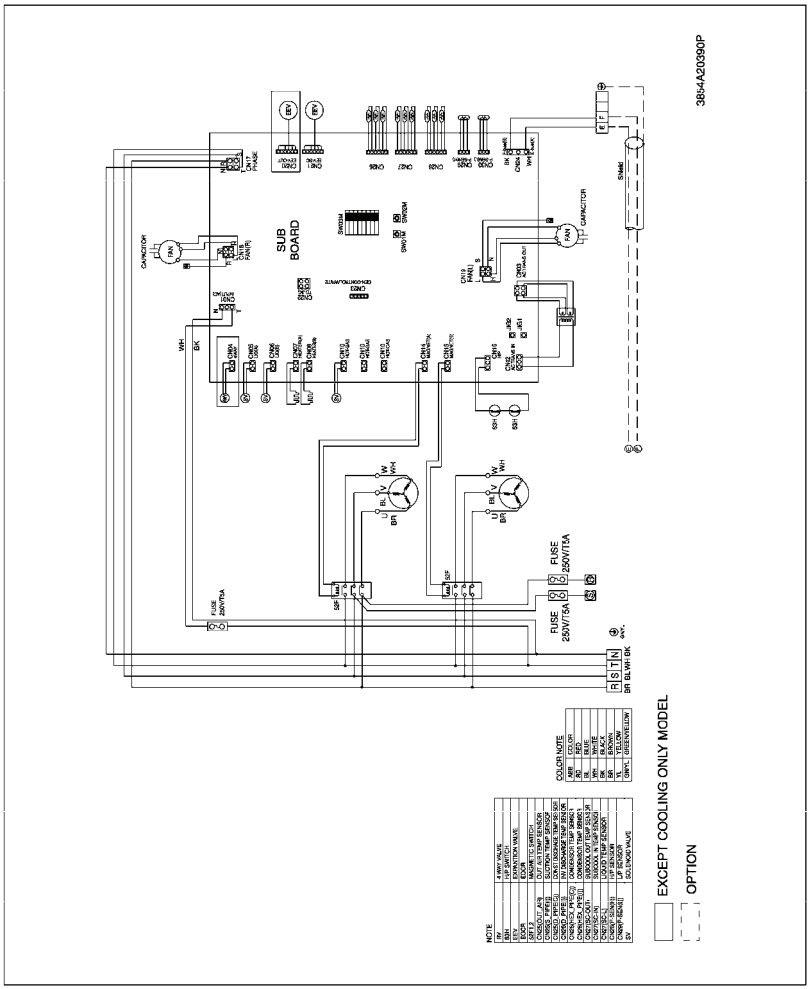


1.7.1.5 Multi V Plus II 10,12HP(UW1)

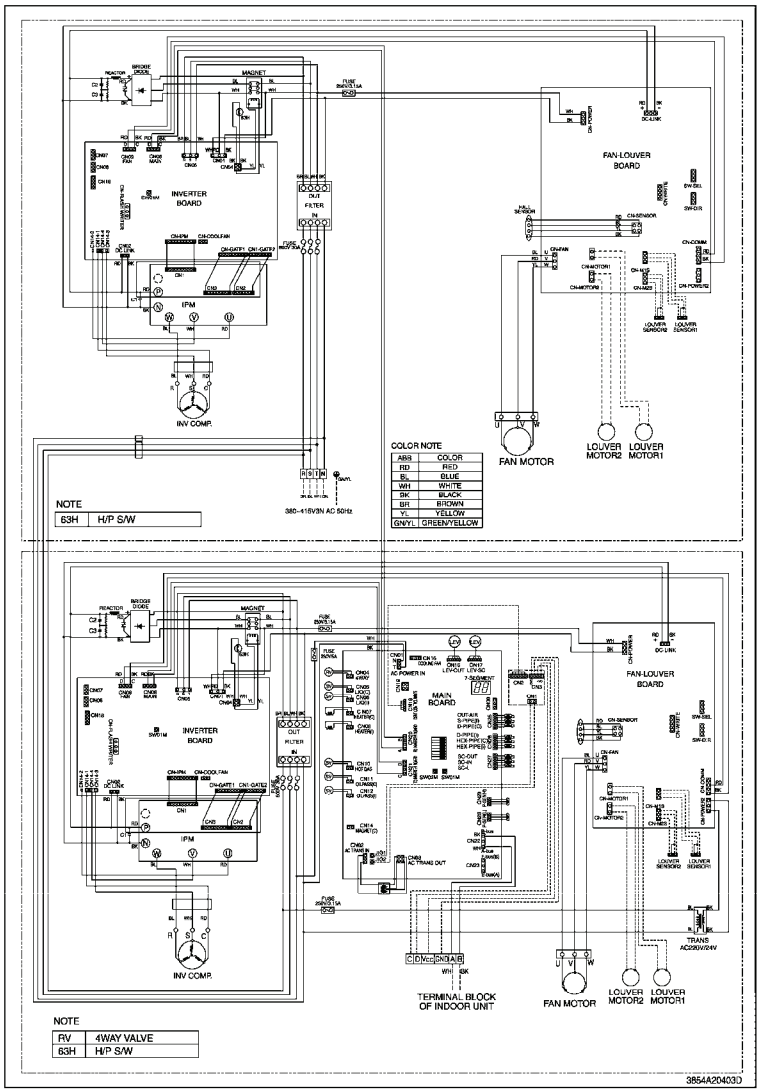




1.7.1.6 Multi V Plus Sub Unit

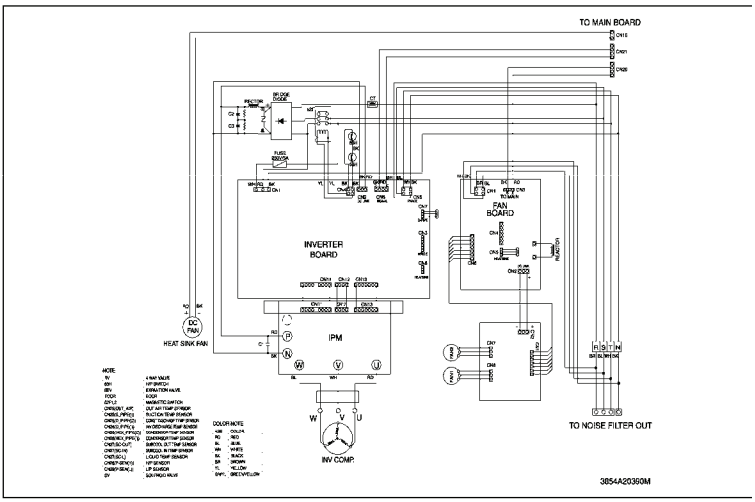


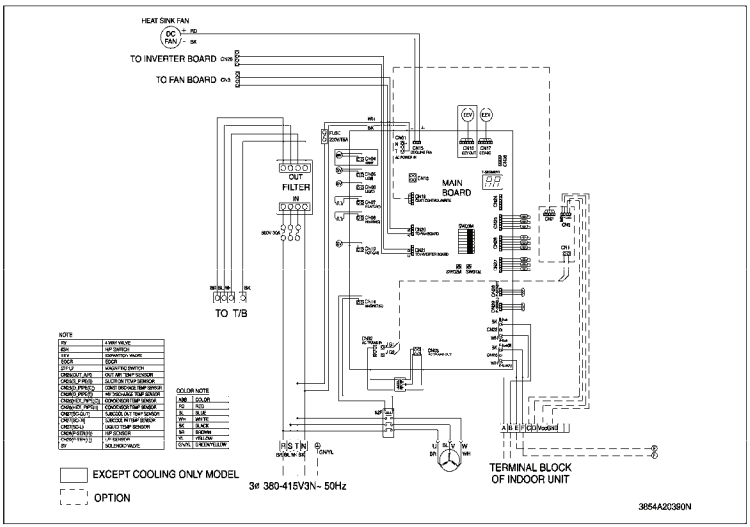
1.7.2 Multi V Space



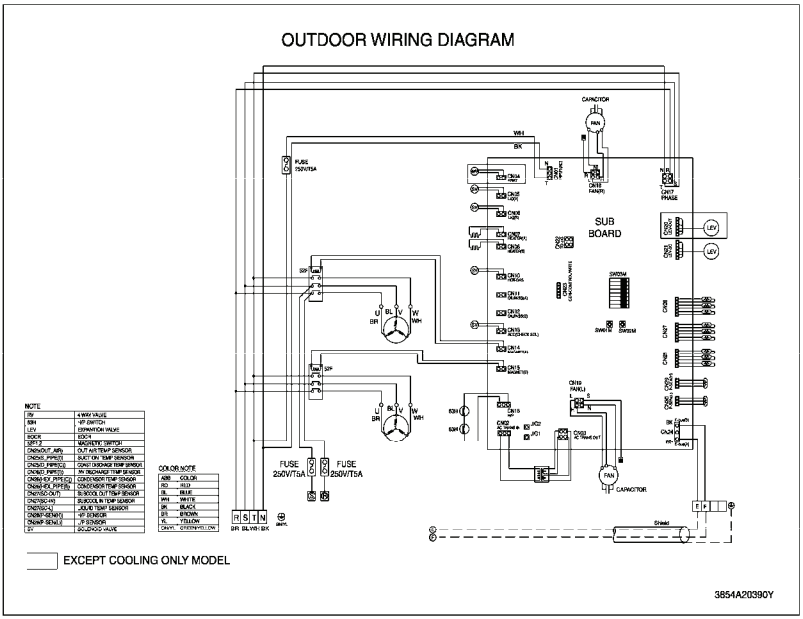
1.7.3 Multi V Sync

1.7.3.1 Multi V Sync Main Unit

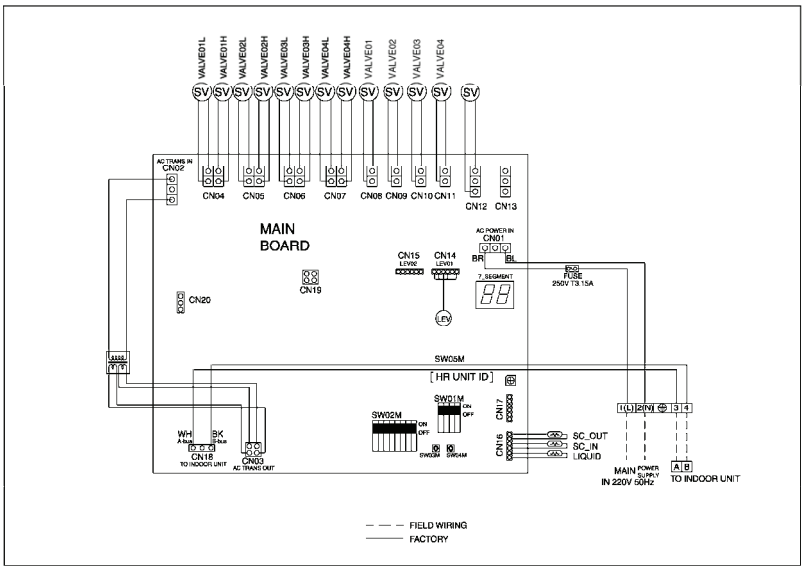




1.7.3.2 Multi V Sync Sub Unit



1.7.4 HR Unit


VALVE01L
VALVE01H
VALVE02L
VALVE02H
VALVE03L
VALVE03H
VALVE04L
VALVE04H
VALVE01
VALVE02
VALVE03
VALVE04
SV
AC TRANS IN CN02
CN04
CN05
CN06
CN07
CN08
CN09
CN10
CN11
CN12
CN13
MAIN BOARD
CN19
CN20
CN15
LEV02
CN14
LEV01
AC POWER IN CN01
BR
BL
7_SEGMENT
FUSE 250V T3.15A
LEV
SW05M
[HR UNIT ID]
SW01M
SW02M
SW03M
SW04M
ON
OFF
CN17
CN16
SC_OUT
SC_IN
LIQUID
WH
BK
CN18
TO INDOOR UNIT
CN03
AC TRANS OUT
MAIN POWER SUPPLY IN 220V 50HZ
TO INDOOR UNIT
FIELD WIRING
FACTORY

MEMO

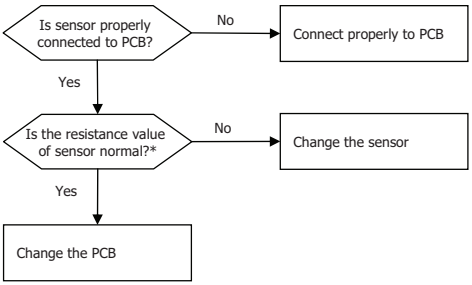
2. Troubleshooting Guide for each Error Code*

* Includede model :
Plus, Sync, Plus II (Tropical)

LG Electronics Inc.

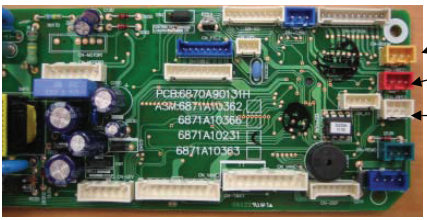
Error code	Error Contents	Meaning	Main Causes
01	Indoor unit air sensor error	Indoor unit sensor is open/short	1. Indoor unit PCB wrong connection 2. Indoor unit PCB failure 3. Sensor problem (main reason)
02	Indoor unit pipe inlet sensor error		
06	Indoor unit pipe outlet sensor error		

Error diagnosis and countermeasure flow chart



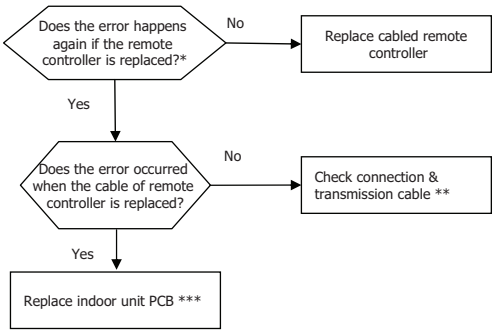
* In case the value is more than 100 kΩ (open) or less than 100 Ω(short), Error occurs

Refer: Resistance value maybe change according to temperature of temp sensor,
It shows according to criteria of current temperature(±5% margin) → Normal
Air temp sensor: 10℃ = 20.7kΩ : 25℃= 10kΩ : 50℃= 3.4kΩ
Pipe temp sensor: 10℃ = 10kΩ : 25℃= 5kΩ : 50℃= 1.8kΩ

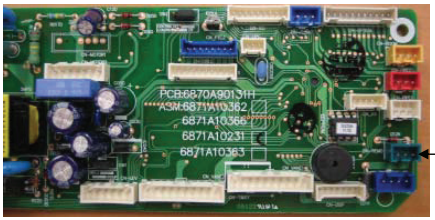


Error code	Error Contents	Meaning	Main Causes
03	No transmission between cabled remote controller & indoor unit	The remote controller did not receive the signal from indoor unit during specific time	1. Remote controller fault 2. Indoor unit PCB fault 3. Connector fault, Wrong connection 4. transmission cable problem

Error diagnosis and countermeasure flow chart

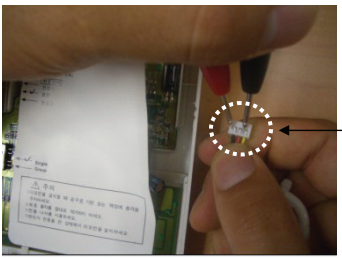

Does the error happens again if the remote controller is replaced?*
No
Replace cabled remote controller
Yes
Does the error occurred when the cable of remote controller is replaced?
No
Check connection & transmission cable **
Yes
Replace indoor unit PCB ***

* If there is no remote controller to replace : Use another unit's remote controller doing well
** Check cable : Contact failure of connected portion or extension of cable are main cause
Check any surrounded noise (check the distance with main power cable)
→ make safe distance from the devices generate electromagnetic wave
*** After replacing indoor unit PCB, do Auto Addressing & input unit's address if connected to central controller.
(All the indoor units connected should be turned on before Auto Addressing



CN-REMO : Remote controller connection

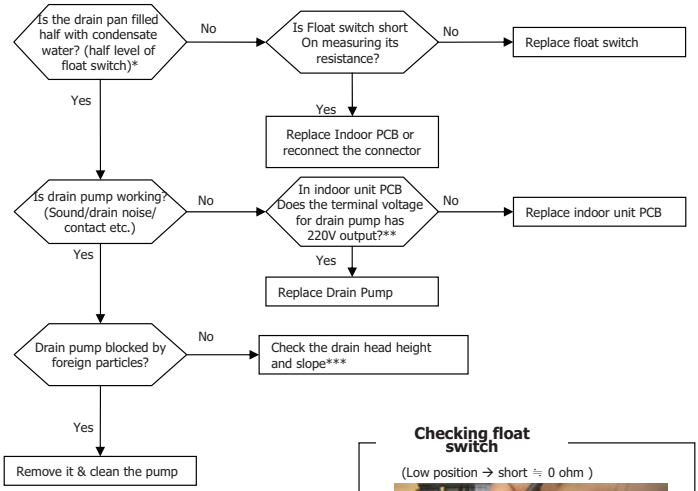
※The PCB can differ from model to model.
Check from the right source.



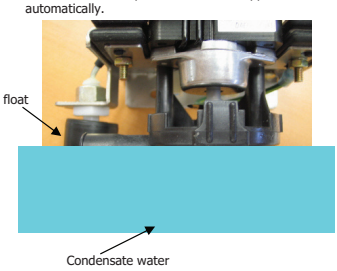
Checking transmission cable connection status

Error code	Error Contents	Meaning	Main Causes
04	Drain pump error	Float switch is open due to rising of condensate water level because of drain pump fault or drain pipe clogging	1. Drain pump/float switch fault 2. Improper drain pipe location, clogging of drain pipe 3. Indoor unit PCB fault

Error diagnosis and countermeasure flow chart


Is the drain pan filled half with condensate water? (half level of float switch)*
No
Is Float switch short On measuring its resistance?
No
Replace float switch
Yes
Yes
Replace Indoor PCB or reconnect the connector
Is drain pump working? (Sound/drain noise/ contact etc.)
No
In indoor unit PCB Does the terminal voltage for drain pump has 220V output?**
No
Replace indoor unit PCB
Yes
Yes
Replace Drain Pump
Drain pump blocked by foreign particles?
No
Check the drain head height and slope***
Yes
Remove it & clean the pump

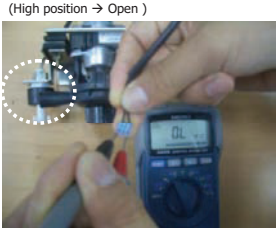
*If the float goes up higher than a half of float switch then the circuit is open & the unit is stopped automatically.

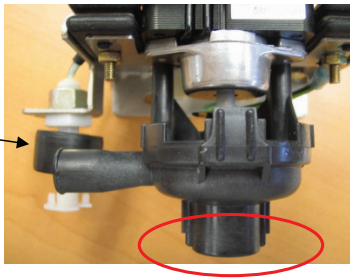


Checking float switch

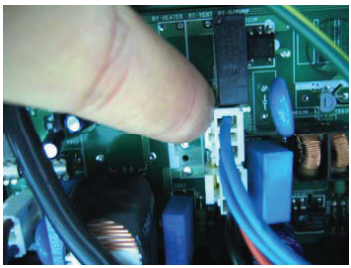
(Low position → short ≒ 0 ohm)

(High position → Open)

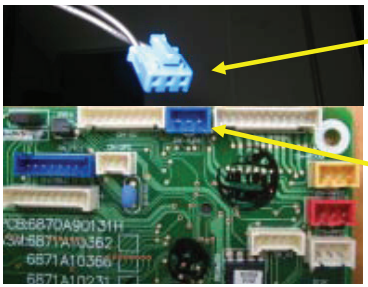




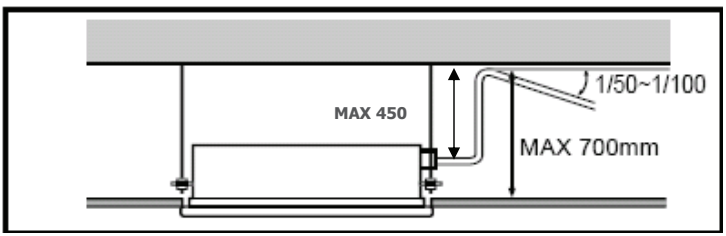
A:Point to check rotating



***Indoor PCB drain pump connector
(Check input of 220V)
(Marked as CN-DPUMP)

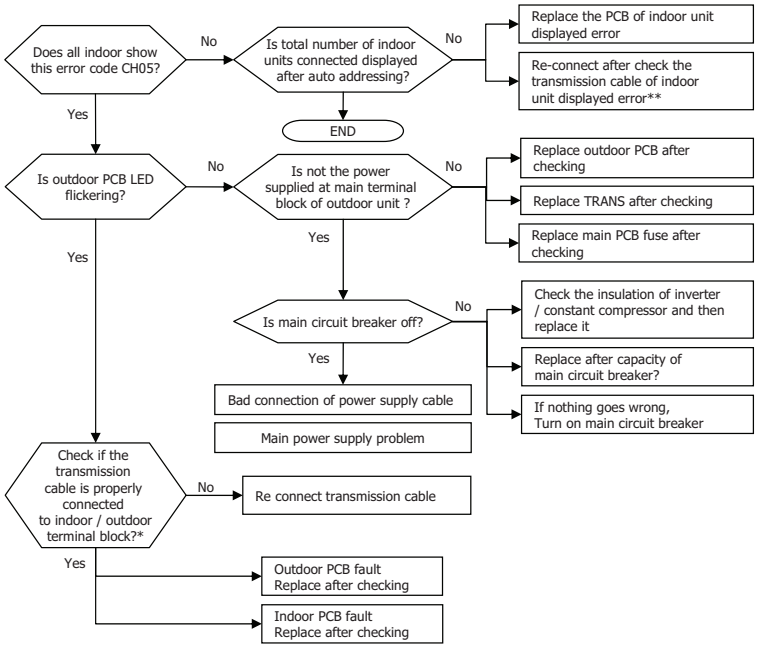


[***]Standard of drain pipe head height / slope



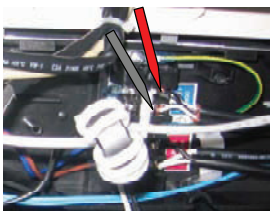
Error code	Error Contents	Meaning	Main Causes
05	Indoor & Outdoor unit transmission error	No signal transmission between indoor & outdoor units.	1. Auto addressing is not done 2. transmission cable is not connected 3. Short circuit of transmission cable 4. Indoor unit transmission circuit fault 5. Outdoor unit transmission circuit fault 6. Not enough distance between power and transmission cable? 7. Is the fuse for main PCB power of outdoor unit burnt out?

Error diagnosis and countermeasure flow chart


Does all indoor show this error code CH05?
No
Is total number of indoor units connected displayed after auto addressing?
No
Replace the PCB of indoor unit displayed error
Re-connect after check the transmission cable of indoor unit displayed error**
Yes
END
Is outdoor PCB LED flickering?
No
Is not the power supplied at main terminal block of outdoor unit ?
No
Replace outdoor PCB after checking
Replace TRANS after checking
Replace main PCB fuse after checking
Yes
Yes
Is main circuit breaker off?
No
Check the insulation of inverter / constant compressor and then replace it
Yes
Replace after capacity of main circuit breaker?
Bad connection of power supply cable
If nothing goes wrong, Turn on main circuit breaker
Main power supply problem
Check if the transmission cable is properly connected to indoor / outdoor terminal block?*
No
Re connect transmission cable
Yes
Outdoor PCB fault
Replace after checking
Indoor PCB fault
Replace after checking

* If the DC voltage between transmission terminal A, B of outdoor unit is fluctuate within (-9V~+9V) then transmission from indoor unit is normal

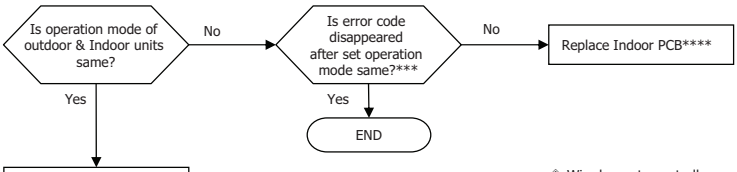
** If the DC voltage between transmission terminal A, B of indoor unit is fluctuate within (-9V~+9V) then transmission from outdoor unit is normal



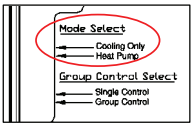
Error Code	Error Contents	Meaning	Main Causes
06	Indoor unit outlet pipe temperature sensor error	Indoor unit outlet pipe temperature sensor open or short	Refer to CH02

07	All Indoor units are not running in same mode	The Indoor units started later are operated in different mode from earlier one.	1. Indoor units are in different mode 2. PCB fault 3. Wrong setting of wired remote controller or remote controller fault*

Error diagnosis and countermeasure flow chart



◈ Wired remote controller

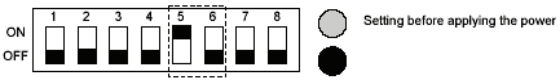


* Check mode select setting of wired remote controller.

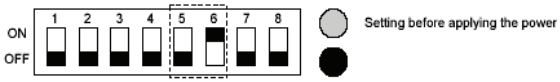
** Outdoor main PCB dip switch no.5 (Cooling) or no.6 (heating) is in On, different mode operation error may be occurred because the operation mode is fixed by dip switch setting.

◈ Dip switch Setting ◈

1. Cooling mode only



2. Heating mode only



*** Dissolution method CH07 with remote controller
1) Error removal method : Turn off remote controller by pressing the On/Off button on the cabled remote controller.
The error code will be removed automatically after a few seconds.
With cableless remote controller: Turn off indoor unit, and turn on with the other operation mode the error will disappeared
2) Immediately change the operation mode after the pressing the On/Off button .
The same operation mode as in the indoor unit started at first other than the defective unit mode (heating /cooling)

**** After replacing the indoor unit PCB, it should be done to do Auto addressing and input the address of central control

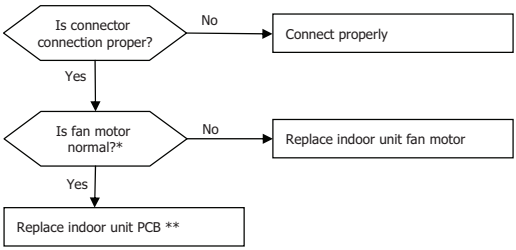
Error Code	Error Contents	Meaning	Main Causes
09	Indoor unit EEPROM error	Problem in EEPROM inside Indoor PCB ASS'Y 내 EEPROM	1.Error developed in transmission between the micro-processor and the EEPROM on the surface of the PCB. 2.ERROR due to the EEPROM damage

Error diagnosis and countermeasure flow chart

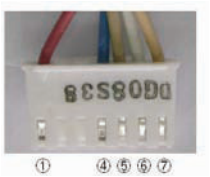
- Replace the indoor unit PCB, and then make sure to do Auto addressing and input the address of central control

Error Code	Error Contents	Meaning	Main Causes
10	Indoor unit BLDC fan motor failure	Indoor BLDC fan motor feedback signal is absent (for 50 sec.)	1. Motor connector connection fault 2. Indoor PCB fault 3. Motor fault

Error diagnosis and countermeasure flow chart



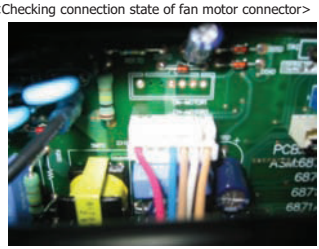
* It is normal when check hall sensor of indoor fan motor as shown below



each terminal with the tester

Tester		Normal resistance (±10%)	
+	-	TH chassis	TD chassis
①	④	∞	∞
⑤	④	hundreds kΩ	hundreds kΩ
⑥	④	∞	∞
⑦	④	hundreds kΩ	hundreds kΩ

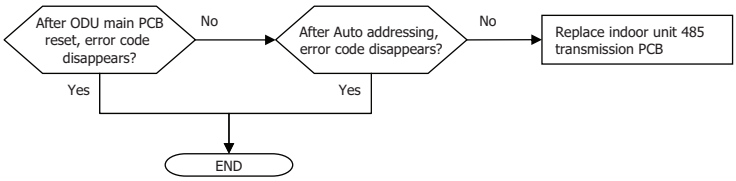
<Checking connection state of fan motor connector>



** Replace the indoor unit PCB, and then make sure to do Auto addressing and input the address of central control
(Notice: The connection of motor connector to PCB should be done under no power supplying to PCB)

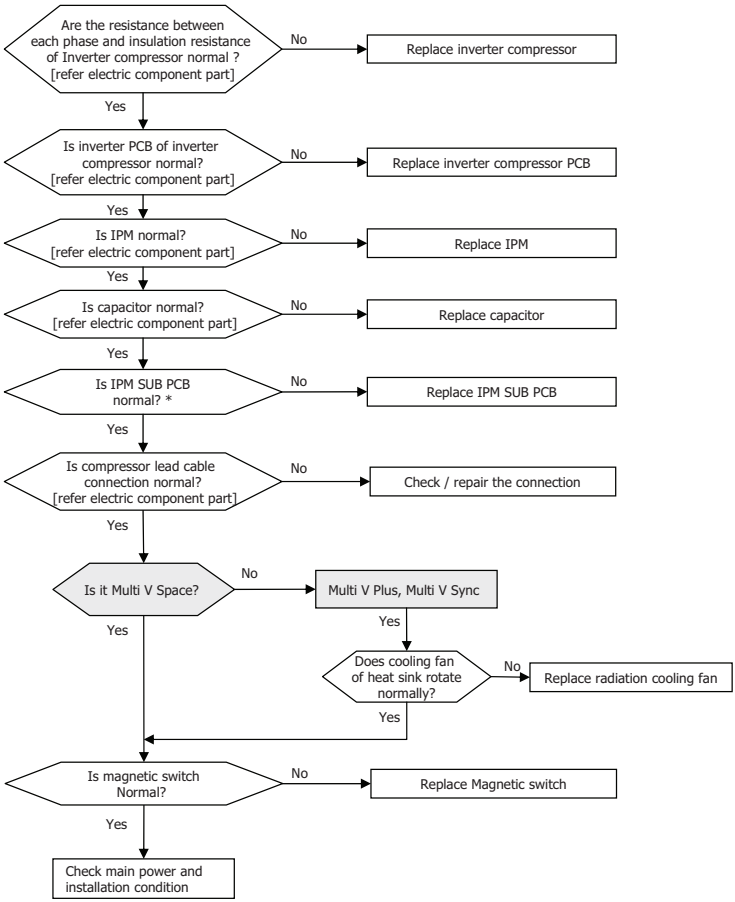
Error Code	Error Contents	Meaning	Main Causes
11	Indoor unit transmission error	Indoor unit doesn't get signal from ODU for 3 minutes continuously	1. Indoor 485 transmission PCB fault 2. After PCB replacing, auto addressing was not done

Error diagnosis and countermeasure flow chart



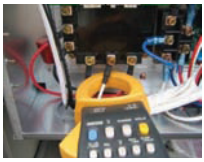
Error Code			Error Contents	Meaning	Main Causes
Plus :21 Plus II: 211,212,213,214			IPM fault of inverter compressor	Defective inverter compressor, Inverter element (IPM) defect	1. Over current detection at the inverter compressor (U,V.W) 2. IPM overheating. 3. Insulation damage of the compressor / compressor motor damage 4. Low input voltage at the outdoor 5. Inverter compressor terminal disconnected or loose. 6. Inverter PCB / IPM PCB defect
SPACE	N1 21	Right Comp.			
	N2 21	Left Comp.			

Error diagnosis and countermeasure flow chart



<table>
<tr><th colspan="2">Point</th><th>Checking</th></tr>
<tr><td rowspan="2">INV Comp. Running Current

(COMP start)</td><td>Plus</td><td>- Deviation between phases should be less than 2A.

U phase
 
V phase

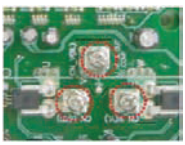
W phase</td></tr>
<tr><td>Plus II</td><td>

 </td></tr>
<tr><td>Coil resistance (No power)</td><td colspan="2">INV, const. speed comp. resistance :INV COMP → 1.2Ω±10%(Plus), 0.35Ω±10%(plus II)
:Constant speed COMP : (U-V)1.96Ω/(V-W)1.91Ω/(U-W)1.99Ω±10%)

U-W phases resistance

V-W phase resistance

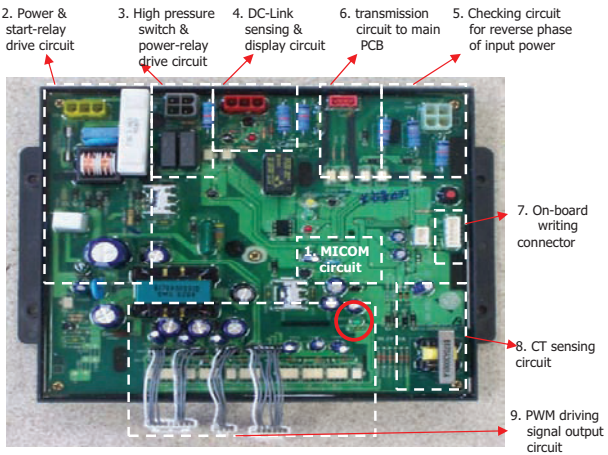
U-V phase resistance</td></tr>
<tr><td>Insulation resistance (No power)</td><td colspan="2">Insulation resistance : INV COMP → above MΩ, const. comp : above MΩ

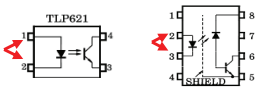
 </td></tr>
<tr><td>Compressor connector</td><td colspan="2">
Comp. connector
 
Comp. conector (Plus II)

Cooling fan connector

Cooling fan operation

IPM bolt connecting</td></tr>
</table>

Part (Function)	Check points
INV COMP PCB (INV COMP part) (plus)	

Phenomena	Check point	How to check?	Counter-measure
No power at PCB	2.Power	-Input voltage should be 220V. (when power is supplied) -Input resistance should be more than a few kΩ (when power is not supplied)	- Check & replace fuse(3.15A), T-N voltage (220V) - If resistance value is 0~100Ω , replace PCB
No transmission	6.Transmission circuit to main PCB	-Yellow LED should blink.	- Check yellow LED blinks or not - When is OFF, check transmission with main PCB and replace
Malfunction of inverter compressor	9.PWM signal cable	--Green LED should blink. -Check IC port coupler of PWM drive (when power is not supplied) 	- Replace PCB
Inverter compressor PCB Error	Red LED	-When red LED blinks. Error displays about inverter compressor PCB	-Check error code displayed at main PCB

<table>
<tr><td>Part
(Function)</td><td colspan="2">Check point</td></tr>
<tr><td rowspan="2">IPM

(CH21
CH22)

(Plus)</td><td>Check voltage &
resistance of
each phases
(When power
is not supplied)</td><td>
P-U :DIODE(0.4V)
resistance(a few MΩ)

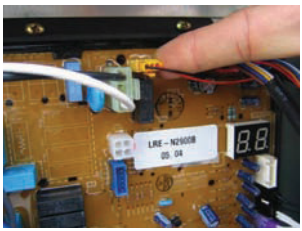
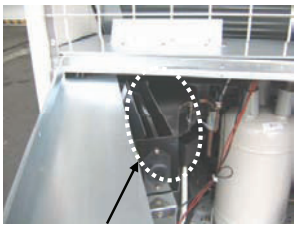
P-V :DIODE(0.4V)
resistance(a few MΩ)

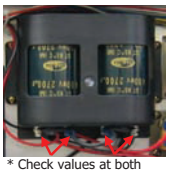
P-W :DIODE(0.4V)
resistance(a few MΩ)

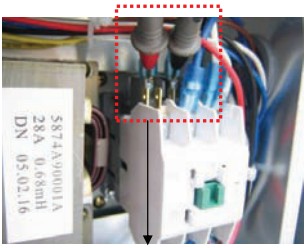
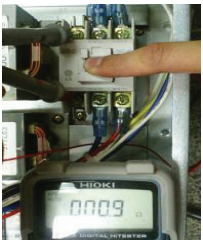
N-U :DIODE(0.4V)
resistance(a few MΩ)

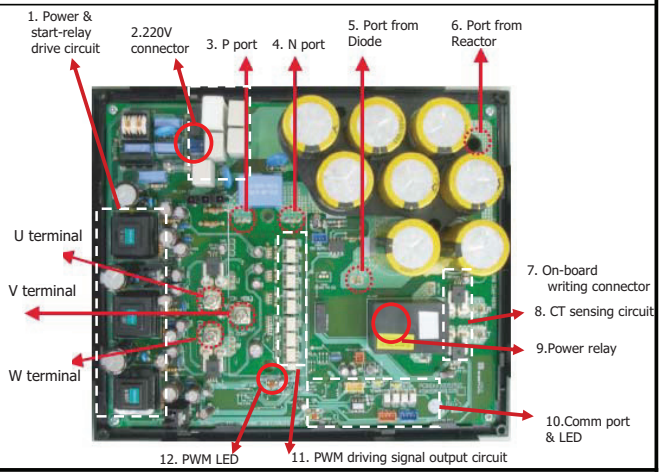
N-V :DIODE(0.4V)
resistance(a few MΩ)

N-W :DIODE(0.4V)
resistance(a few MΩ)</td></tr>
<tr><td>Sub PCB</td><td>
Check the IPM terminal connecting condition</td></tr>
<tr><td>Heat sink
cooling fan

(Plus)</td><td colspan="2"> 
Position of cooling fan
drive connector in main PCB
 
Heat sink cooling fan</td></tr>
</table>

Part (Function)	Check points	How to check?	Counter-measure
Capacitor (To charge DC voltage for inverter compressor) (Plus)	Electric capacity. (when power is not supplied)	-Electricity capacity of capacitor must be 2600~2800㎌ and the resistance of capacitors should be more than a few kΩ  * Check values at both terminal of capacitor	- Replace capacitor when value is more or less than normal spec.
	DC charging voltage (When power is supplied)	- Charged voltage of between terminals of capacitor (= between IPM P-N terminal = DC link terminals) should be more than 450V (At the moment of inverter compressor start)	- Check input voltage and replace capacitor

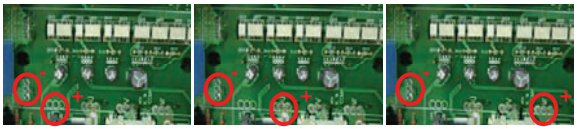
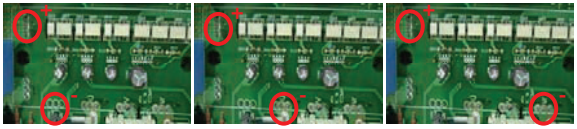
Magnet Switch (Plus)	Magnet switch 1st coil	-When check resistance of 1st coil of magnet switch, resistance should be 0.47 kΩ (When power is not supplied) -When magnet switch is on, voltage should be 220V (When power is not supplied)  ** check point of 1st coil of magnet switch	-In case resistance is ∞ or 0 Ω, → Replace Magnet switch -When voltage is not 220V, magnet switch is melt down - Replace magnet switch
	Magnet switch connection check (In case power is not supplied)	- While pressing green button of magnet switch, Voltage of each connectors should be 0V or Resistance should be 0~1Ω (Warning: power should not be supplied) 	-Replace magnet switch

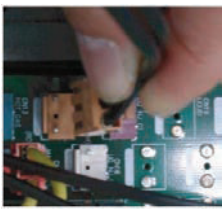
Part (Function)	Check points
INV COMP PCB (INV COMP part) (Plus II)	

Phenomena	Check point	How to check?	Counter-measure
No power at PCB	2.Power	-Input voltage should be 220V. (when power is supplied) -Input resistance should be more than a few kΩ (when power is not supplied)	-T-N voltage (220V) - If resistance value is 0~100Ω , replace PCB
No transmission (Fan, Main PCB)	10.Transmission circuit to main, fan PCB	-LEDs should blink.	- Check LED blinks or not - When is OFF, check transmission with main, fan PCB
Inverter compressor PCB Error	12. PWM LED	-When red LED is on. PWM is normal	-Check error code displayed at main PCB

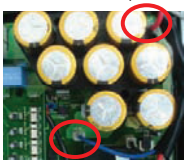
<table>
<tr><th>Part
(Function)</th><th colspan="2">Check point</th></tr>
<tr><td>IPM

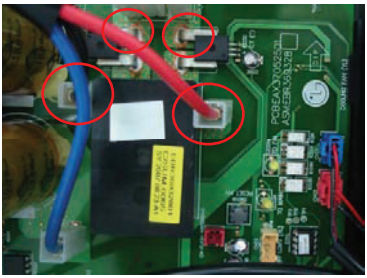
(CH21,
CH22)

(Plus II)</td><td>Check voltage & resistance of each phases (When power is not supplied)</td><td>

P-U :28kΩ±10% P-V :28kΩ±10% P-W : 28kΩ±10%
Reverse: P-U :Open P-V :Open P-W : Open

N-U :28kΩ±10% N-V :28kΩ±10% N-W : 28kΩ±10%
Reverse: N-U :Open N-V :Open N-W : Open
</td></tr>
<tr><td>Heat sink cooling fan

(Plus II)</td><td>Check power supplay and operation status</td><td>

Position of cooling fan drive connector in main PCB (220V output)

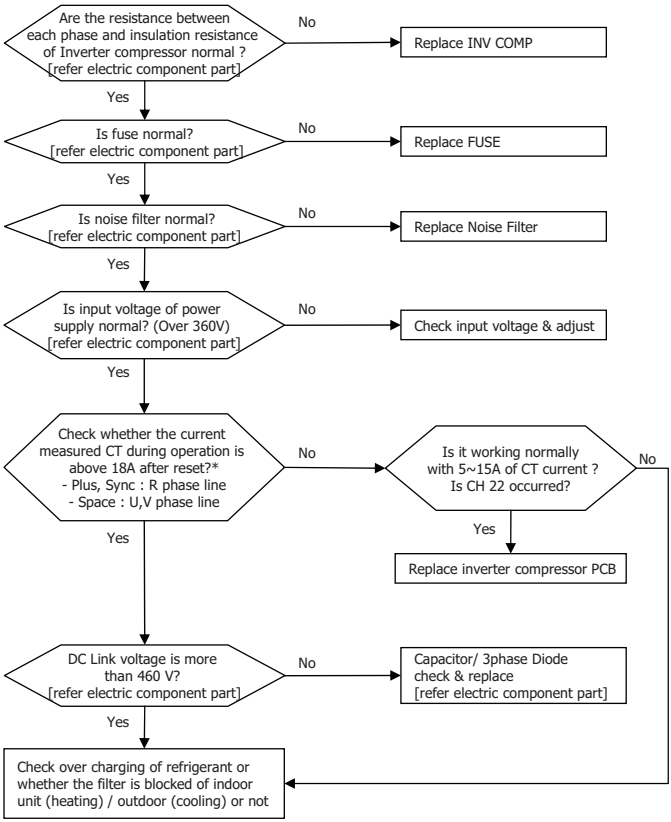
Heat sink cooling fan
</td></tr>
</table>

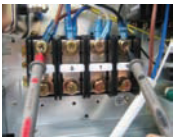
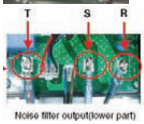
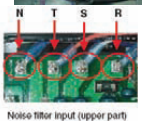
Part (Function)	Check points	How to check?	Counter-measure
Capacitor (To charge DC voltage for inverter compressor) (Plus II)	DC charging voltage (When power is supplied)	- Charged voltage of between terminals of capacitor (= between IPM P-N terminal = DC link terminals) should be more than 450V (At the moment of inverter compressor start)  * Check values at both terminal of capacitor	- Check input voltage and replace capacitor

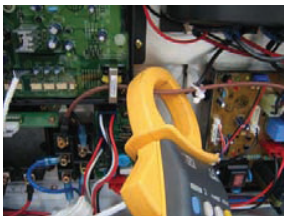
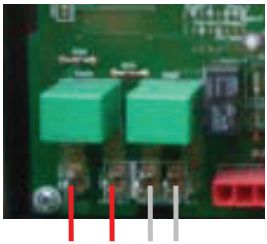
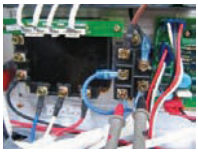
Magnet Switch (Plus II)	Magnet switch	When magnet switch is on, output voltage should be 380V (Running) 	When output voltage is not 380V, Replace PCB

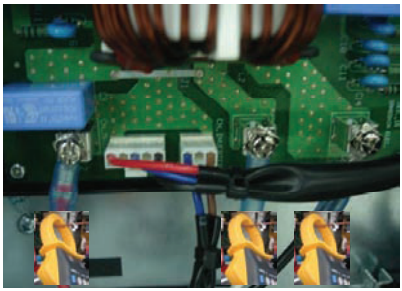
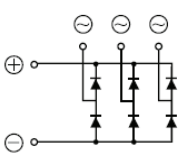
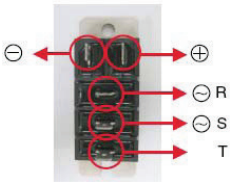
Error code			Error Contents	Meaning	Main Causes
Plus:22 Plus II: 221,222,223,224			Over current of inverter compressor	The current flowing at the CT sensing circuit is more than the allowable maximum value of the current	1. Compressor damage 2. Current sensing sensor (CT) damage 3. Low input voltage 4. compressor terminal is disconnected or loose 5. Abnormality at the outdoor / indoor unit fan 6. Cover or clogging (Outdoor unit covering during cooling mode / Filter clogged at the indoor during heating mode) 7. Defective inverter PCB/IPM PCB
SPACE	N1 22	Right Comp.			
	N2 22	Left Comp.			

Error diagnosis and countermeasure flow chart


Are the resistance between each phase and insulation resistance of Inverter compressor normal ? [refer electric component part]
No
Replace INV COMP
Yes
Is fuse normal? [refer electric component part]
No
Replace FUSE
Yes
Is noise filter normal? [refer electric component part]
No
Replace Noise Filter
Yes
Is input voltage of power supply normal? (Over 360V) [refer electric component part]
No
Check input voltage & adjust
Yes
Check whether the current measured CT during operation is above 18A after reset?* - Plus, Sync : R phase line - Space : U,V phase line
No
Is it working normally with 5~15A of CT current ? Is CH 22 occurred?
No
Yes
Replace inverter compressor PCB
Yes
DC Link voltage is more than 460 V? [refer electric component part]
No
Capacitor/ 3phase Diode check & replace [refer electric component part]
Yes
Check over charging of refrigerant or whether the filter is blocked of indoor unit (heating) / outdoor (cooling) or not

Part (Function)	Check points	How to check?	Counter-measure
T/BLOCK (Terminal Block, Input power)	Check voltage	- Voltage of 3φ(R,S,T) should be within Standard±10% - Voltage of 1φ(R-N,S-N,T-N) should be within 220V±10%. - Voltage fluctuation should be within 10V - While stand-by and in operation, Voltage drop should be within 10V  Checking points of 3φ(R-S) Checking points of 1φ(R-N)	-Check supply power and connection condition
	Check Ω (In case power is not supplied)	- Resistance of R-S,S-T,R-T,R-N,S-N should be more than a few kΩ - Resistance of T-N should be within 40~50Ω (Main transformer of outdoor)	-Check short or not of Control box (Noise filter, PCB, cables) - Replace transformer
FUSE (Protect over-loaded current) (plus)	Check disconnection of FUSE (when power is supplied)	- Voltage of fuse should be within 0~1V Checking points of R φ fuse	-In case of 220V, Fuse is disconnected. → Replace FUSE
	Check disconnection of FUSE (when power is not supplied)	- Resistance of fuse should be within 0~1Ω	-In case resistance is ∞, Fuse is disconnected. → Replace FUSE
Nose filter (Noise emit & protect)	Check voltage (When power is supplied)	-Voltage of each connector (R-R,S-S,T-T) should be within 0~40V (Plus) (Plus II)   T S R N T S R Noise filter output(lower part) Noise filter input (upper part) Checking points of Voltage	- In case of 220V It is disconnected → Replace noise filter
	Check Ω (In case power Is not supplied)	-Resistance of each connectors (R-R,S-S,T-T) should be within 0~10Ω	-In case resistance is ∞, noise filter is disconnected. → Replace noise filter

Part (Function)	Check points
INV PCB (Plus)	* Measure the CT current with clamp meter * - Multi V PLUS / Sync : R phase  -Multi V SPACE : U(+), U(-), V(+), V(-) The current difference among phases is less than 0.5A ±10%  U(+) U(-) V(+) V(-)
3ϕ DIODE (Plus)	 P-U :DIODE(0.4V) resistance(a few MΩ) P-V :DIODE(0.4V) resistance(a few MΩ)  P-W :DIODE(0.4V) resistance(a few MΩ) N-U :DIODE(0.4V) resistance(a few MΩ) N-V :DIODE(0.4V) resistance(a few MΩ) N-W :DIODE(0.4V) resistance(a few MΩ)

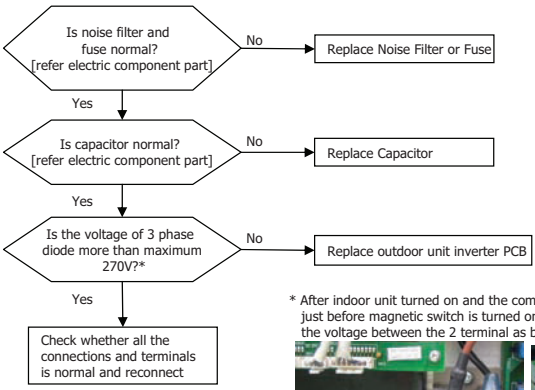
<table>
<tr><th>Part
(Function)</th><th>Check
points</th></tr>
<tr><td>INV PCB
(Plus II)</td><td>* Measure the CT current with clamp meter
*Current < 25A
  </td></tr>
<tr><td>3ϕ DIODE
(Plus II)</td><td> 
 

<table>
<tr><th>Diode terminal / Tester terminal</th><th>+ terminal: black(-)</th><th>- terminal: red(+)</th></tr>
<tr><td>R(~) : red(+)</td><td>0.4 V ~ 0.7 V</td><td>-</td></tr>
<tr><td>S(~) : red(+)</td><td>0.4 V ~ 0.7 V</td><td>-</td></tr>
<tr><td>T(~) : red(+)</td><td>0.4 V ~ 0.7 V</td><td>-</td></tr>
<tr><td>R(~) : black(-)</td><td>-</td><td>0.4 V ~ 0.7 V</td></tr>
<tr><td>S(~) : black(-)</td><td>-</td><td>0.4 V ~ 0.7 V</td></tr>
<tr><td>T(~) : black(-)</td><td>-</td><td>0.4 V ~ 0.7 V</td></tr>
</table>
✻ Red(+) and black(-) are the measuring terminals of multi tester.

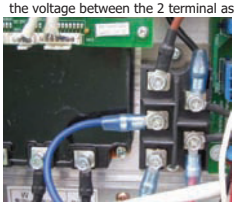
-In case the measured value is different from the table, set multi tester to resistance mode and measure. If the value is small (0 Ω) or high (hundreds M Ω), PCB needs to be replaced.
- In case that bridge diode is damaged, check if inverter PCB assembly(IPM) is needed to be replaced.</td></tr>
</table>

Error Code			Error Contents	Meaning	Main Causes
23(plus) 23(1~4,Plus II)			DC voltage charging for inverter compressor driving defect	Problem in DC charging voltage after starting relay turned on	1. Looseness of DC link terminal 2. Damage in starting relay 3. Capacitor damage 4. Defective sensing circuit of the inverter PCB
SPACE	N1 23	Right Comp.			
	N2 23	Left Comp.			

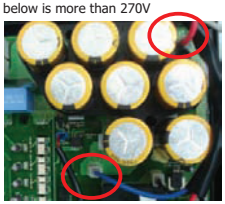
Error diagnosis and countermeasure flow chart


Is noise filter and fuse normal? [refer electric component part]
No
Replace Noise Filter or Fuse
Yes
Is capacitor normal? [refer electric component part]
No
Replace Capacitor
Yes
Is the voltage of 3 phase diode more than maximum 270V?*
No
Replace outdoor unit inverter PCB
Yes
Check whether all the connections and terminals is normal and reconnect

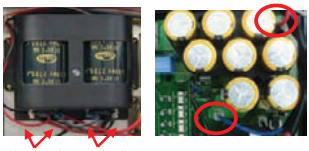
* After indoor unit turned on and the compressor is not operated, just before magnetic switch is turned on the voltage between the 2 terminal as below is more than 270V

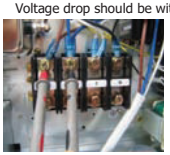
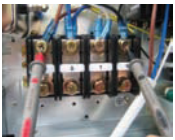
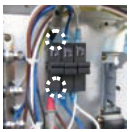
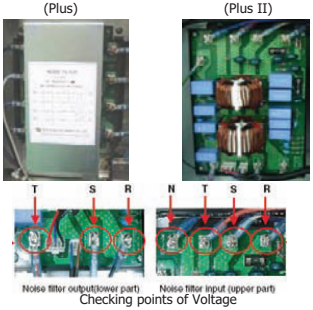


Plus / Sync



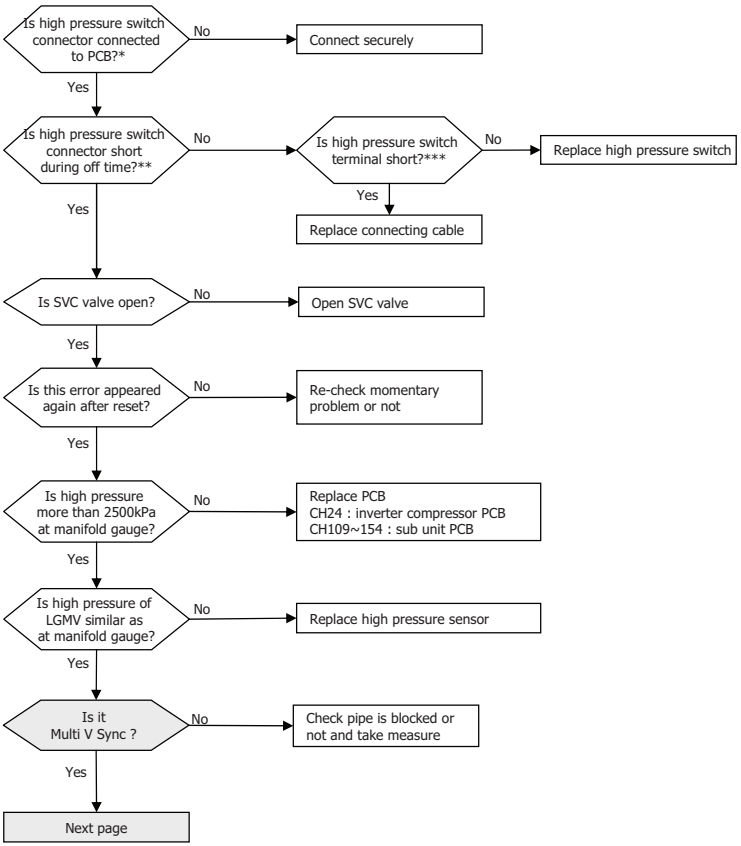
Plus II

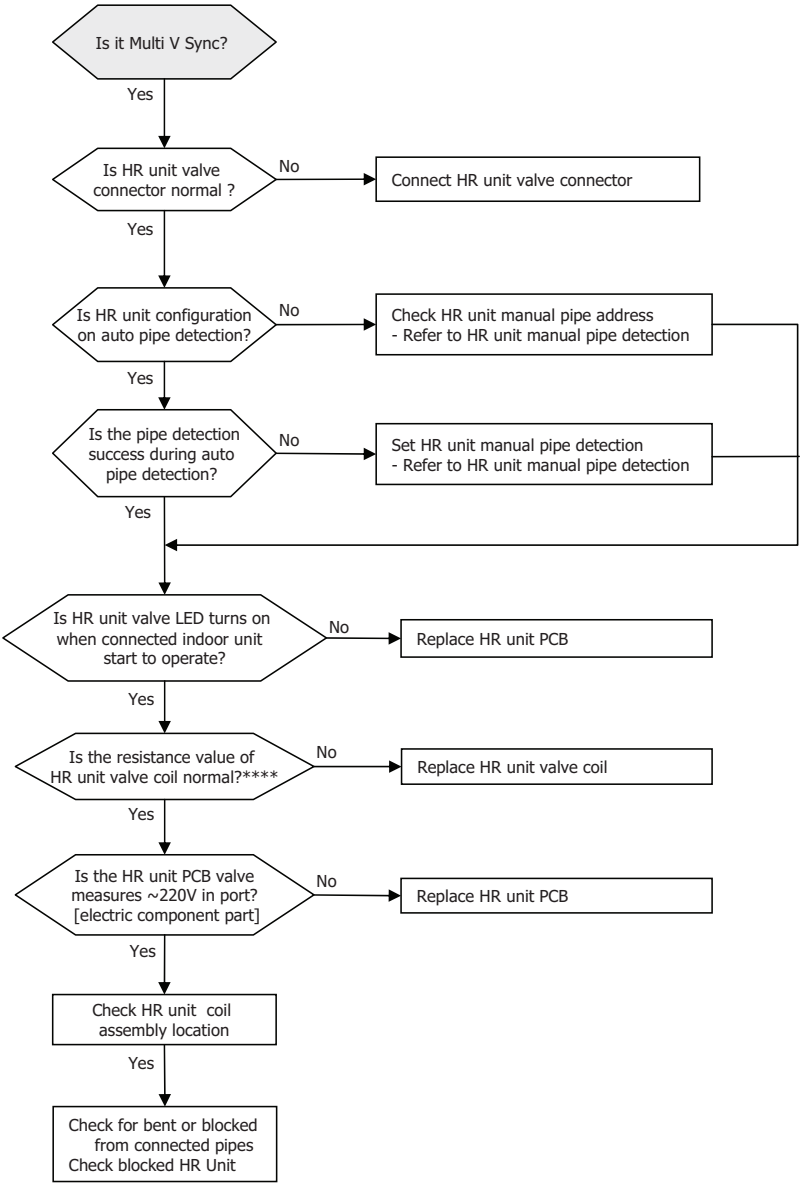
Part (Function)	Check points	How to check?	Counter-measure
Capacitor (To charge DC voltage for inverter compressor)	Electric capacity. (when power is not supplied)	-Electricity capacity of capacitor must be 2600~2800㎌ and the resistance of capacitors should be more than a few kΩ  * Check values at both terminal of capacitor	-Replace capacitor when value is more or less than normal spec.
	DC charging voltage (When power is supplied)	- Charged voltage of between terminals of capacitor (= between IPM P-N terminal = DC link terminals) should be more than 450V (At the moment of inverter compressor start)	- Check input voltage and replace capacitor

Part (Function)	Check points	How to check?	Counter-measure
T/BLOCK (Terminal Block, Input power)	Check voltage	- Voltage of 3ϕ(R,S,T) should be within 380±10% - Voltage of 1ϕ(R-N,S-N,T-N) should be within 220±10%. - Voltage fluctuation should be within 10V - While stand-by and in operation, Voltage drop should be within 10V.   Checking points of 3ϕ(R-S) Checking points of 1ϕ(R-N)	-Check supply power and connection condition
	Check Ω (In case power is not supplied)	- Resistance of R-S,S-T,R-T,R-N,S-N should be more than a few kΩ - Resistance of T-N should be within 40~50Ω (Main transformer of outdoor)	-Check short or not of Control box (Noise filter, PCB, cables) - Replace transformer
FUSE (Protect over-loaded current) (plus)	Check disconnection of FUSE (when power is supplied)	-Voltage of fuse should be within 0~1V  Checking points of R ϕ fuse	-In case of 220V, Fuse is disconnected. → Replace FUSE
	Check disconnection of FUSE (when power is not supplied)	-Resistance of fuse should be within 0~1Ω	-In case resistance is ∞, Fuse is disconnected. → Replace FUSE
Nose filter (Noise emit & protect)	Check voltage (When power is Supplied)	-Voltage (R-R,S-S,T-T) < 0~10V → If voltage is higer than 10~40V, check resistance (Plus) (Plus II)  Checking points of Voltage	- In case of 220V It is disconnected → Replace noise filter
	Check Ω (In case power Is not supplied)	-Resistance of each connectors (R-R,S-S,T-T) should be within 0~10Ω	-In case resistance is ∞, noise filter is disconnected. → Replace noise filter

Error Code			Error Contents	Meaning	Main Causes
24(Plus Main) 24(1~4,Plus II)			Excessive rise of discharge pressure in outdoor compressor	Compressor off due to the high pressure switch in outdoor unit	1. High pressure switch defect 2. Fan defect of indoor unit or outdoor unit 3. Check valve of compressor clogged 4. Pipe distortion due to the pipe damage 5. Refrigerant overcharge 6. LEV defect at the indoor or outdoor unit . 7. Covering or clogging (Outdoor covering during the cooling mode / Indoor unit filter clogging during the heating mode) 8. SVC valve clogging 9. Outdoor PCB defect 10. HR unit valve coil defect(Multi V Sync) 11. HR unit PCB defect(Multi V Sync)
SPACE	N1 24	Right Comp.			
	N2 24	Left Comp.			
(plus) 109 (Sub1) 140 (Sub2) 154 (Sub3)					

Error diagnosis and countermeasure flow chart

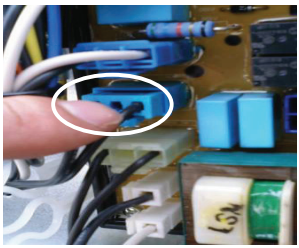



Is it Multi V Sync?
Yes
Is HR unit valve connector normal ?
No
Connect HR unit valve connector
Yes
Is HR unit configuration on auto pipe detection?
No
Check HR unit manual pipe address
- Refer to HR unit manual pipe detection
Yes
Is the pipe detection success during auto pipe detection?
No
Set HR unit manual pipe detection
- Refer to HR unit manual pipe detection
Yes
Is HR unit valve LED turns on when connected indoor unit start to operate?
No
Replace HR unit PCB
Yes
Is the resistance value of HR unit valve coil normal?****
No
Replace HR unit valve coil
Yes
Is the HR unit PCB valve measures ~220V in port? [electric component part]
No
Replace HR unit PCB
Yes
Check HR unit coil assembly location
Yes
Check for bent or blocked from connected pipes
Check blocked HR Unit

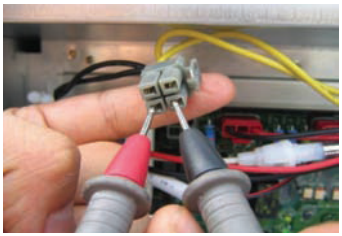
* Plus : Connector location of high pressure switch at PCB(Refer electrical component part for Multi V Space)

Inverter compressor PCB

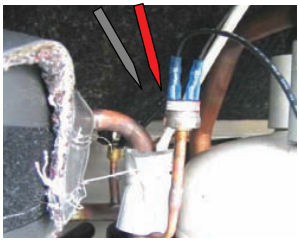
SUB outdoor unit PCB



Checking short or not at connector of high pressure switch

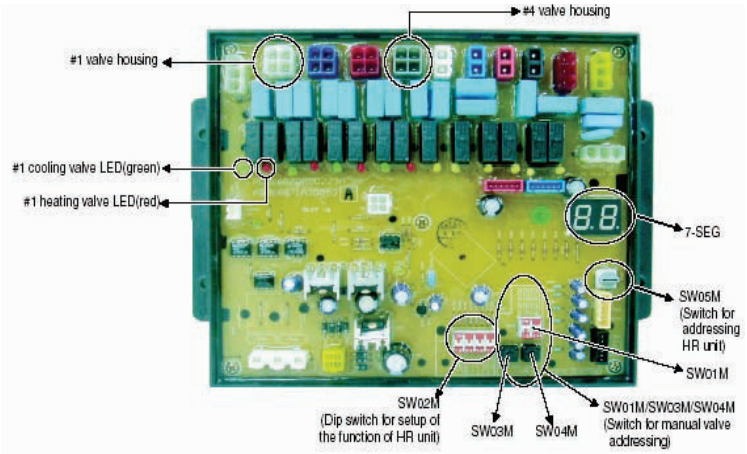


Checking short or not at connector of high pressure switch



**** Check resistance of HR unit valve coil : 1.85 kΩ(±10%)

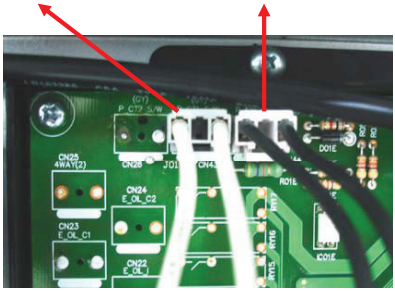
- HR unit PCB-



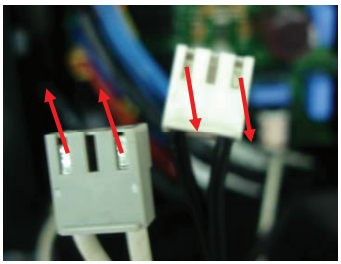
* Plus II: Connector location of high pressure switch at PCB(Refer electrical component part for Mult V Space)

Constant compressor pressure switch

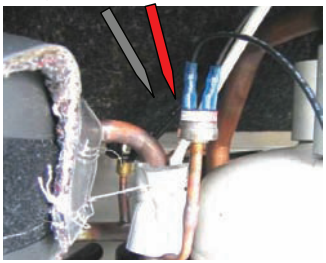
Inverter compressor pressire switch



** Checking short or not at connector of high pressure switch

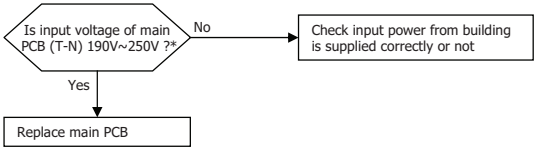


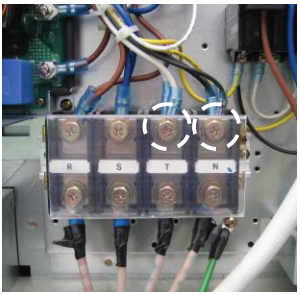
*** Checking short or not at connector of high pressure switch



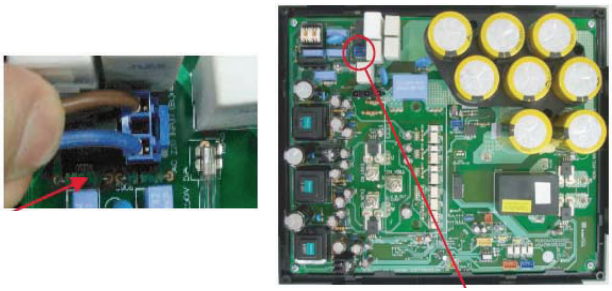
Error Code	Error Contents	Meaning	Main Causes
Plus: 25(Main) 147 (Sub1) 149 (Sub2) 171 (Sub3) Plus I:, 251,252,253, 254	Low / over voltage of main PCB input	The power supply input voltage tolerance is more or less than allowable standard	1. Input voltage is abnormal(T-N) 2. Outdoor unit main PCB defect

Error diagnosis and countermeasure flow chart


Is input voltage of main PCB (T-N) 190V~250V ?*
No
Check input power from building is supplied correctly or not
Yes
Replace main PCB



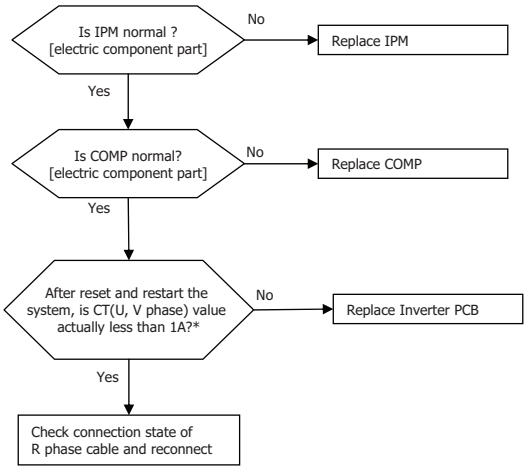
* Check voltage at outdoor T/Block(220V)



* Check voltage at outdoor T/Block(220V), Plus II

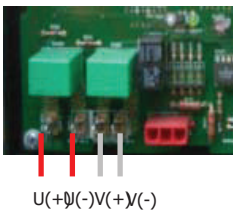
Error code			Error Contents	Meaning	Main Causes
Plus II: 261,262, 263,264			Compressor start failure	At below min.Hz, U,V current is lower than 1A	1. U,V상 connect orCOMP fault 2. DC CT sensor fault 3. INV PCB fault 4. IPM component or connector fault
SPACE	N1 26	Right Comp.			
	N2 26	Left Comp.			

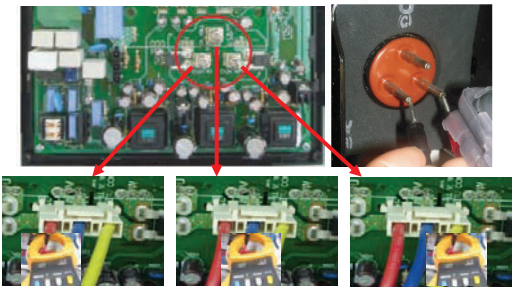
Error diagnosis and countermeasure flow chart



- Measure the CT current with clamp meter
  : U(+), U(-), V(+), V(-)
  - The current difference among phases is less than 0.5A ±10%

* Measuring resistance between each terminal of compressor



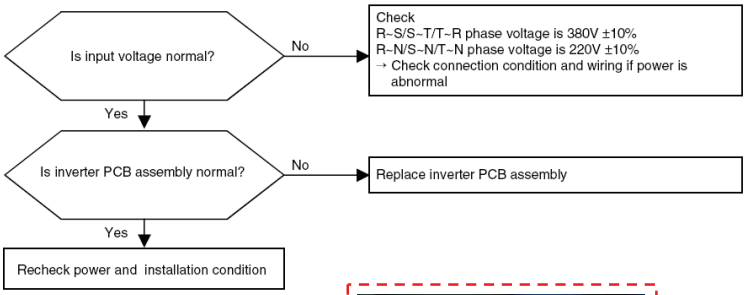


Multi V Space

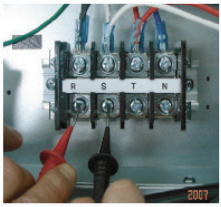
Multi V Plus II

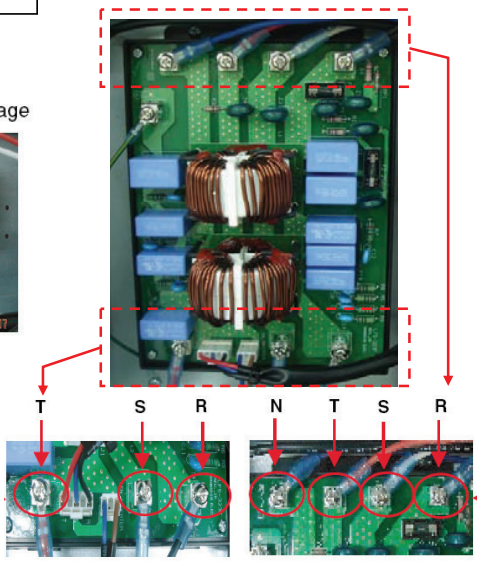
Error No.	Error Type	Error Point	Main Reasons
28* Master 281 Slave1 282 Slave2 283	Inverter DC link high voltage error	Inv PCB DC link voltage supplied over 780V	1. Input voltage abnormal (R,S,T,N) 2. ODU inverter PCB damage (DC Link voltage sensing part)

Error diagnosis and countermeasure flow chart



* Measuring input voltage

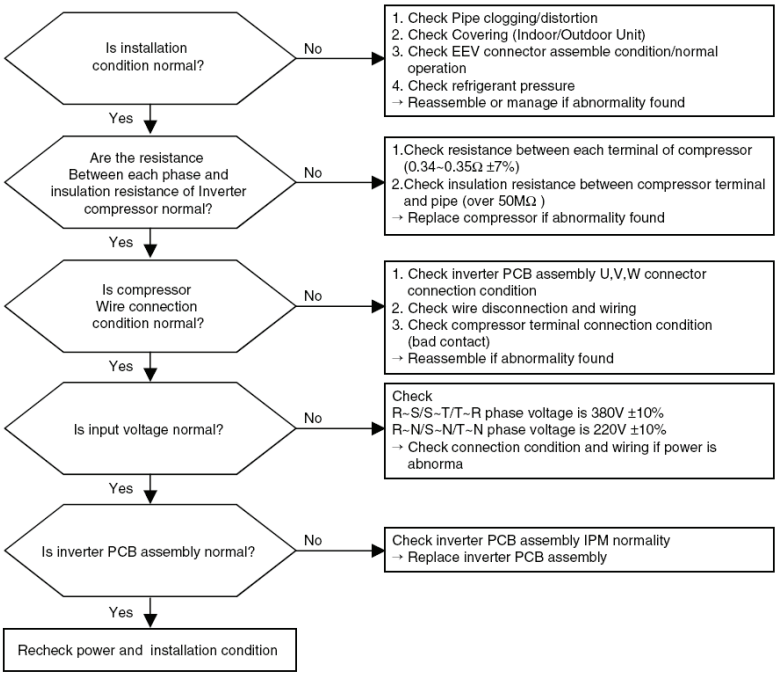




Noise filter output(lower part) Noise filter input (upper part)

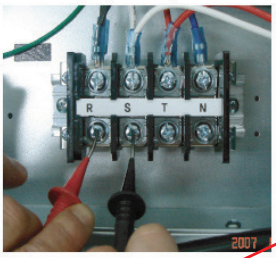
Error No.	Error Type	Error Point	Main Reasons
29* Master 291 Slave1 292 Slave2 293	Inverter compressor over current	Inverter compressor input current is over 30A	1. Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge) 2. Compressor damage(Insulation damage/Motor damage) 3. Input voltage low 4. ODU inverter PCB assembly damage

Error diagnosis and countermeasure flow chart

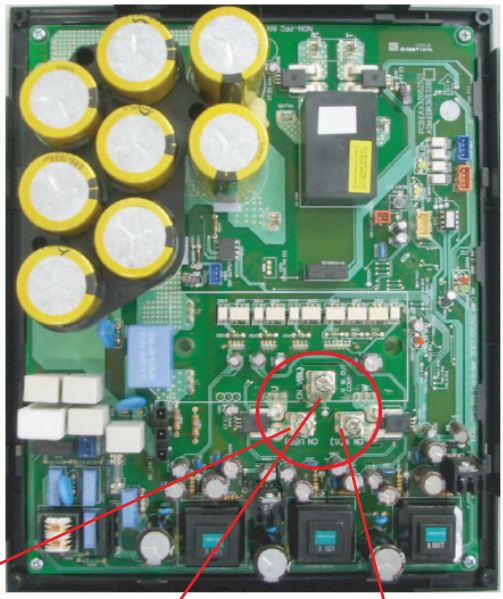

Is installation condition normal?
No
1. Check Pipe clogging/distortion
2. Check Covering (Indoor/Outdoor Unit)
3. Check EEV connector assemble condition/normal operation
4. Check refrigerant pressure
→ Reassemble or manage if abnormality found
Yes
Are the resistance Between each phase and insulation resistance of Inverter compressor normal?
No
1.Check resistance between each terminal of compressor (0.34~0.35Ω ±7%)
2.Check insulation resistance between compressor terminal and pipe (over 50MΩ)
→ Replace compressor if abnormality found
Yes
Is compressor Wire connection condition normal?
No
1. Check inverter PCB assembly U,V,W connector connection condition
2. Check wire disconnection and wiring
3. Check compressor terminal connection condition (bad contact)
→ Reassemble if abnormality found
Yes
Is input voltage normal?
No
Check
R~S/S~T/T~R phase voltage is 380V ±10%
R~N/S~N/T~N phase voltage is 220V ±10%
→ Check connection condition and wiring if power is abnorma
Yes
Is inverter PCB assembly normal?
No
Check inverter PCB assembly IPM normality
→ Replace inverter PCB assembly
Yes
Recheck power and installation condition

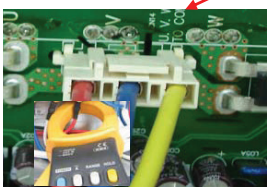
* Measuring resistance between each terminal of compressor

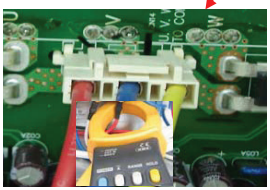
* Measuring input voltage

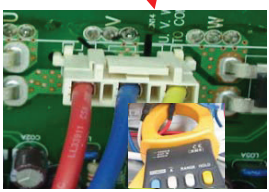


* Compressor wire connection



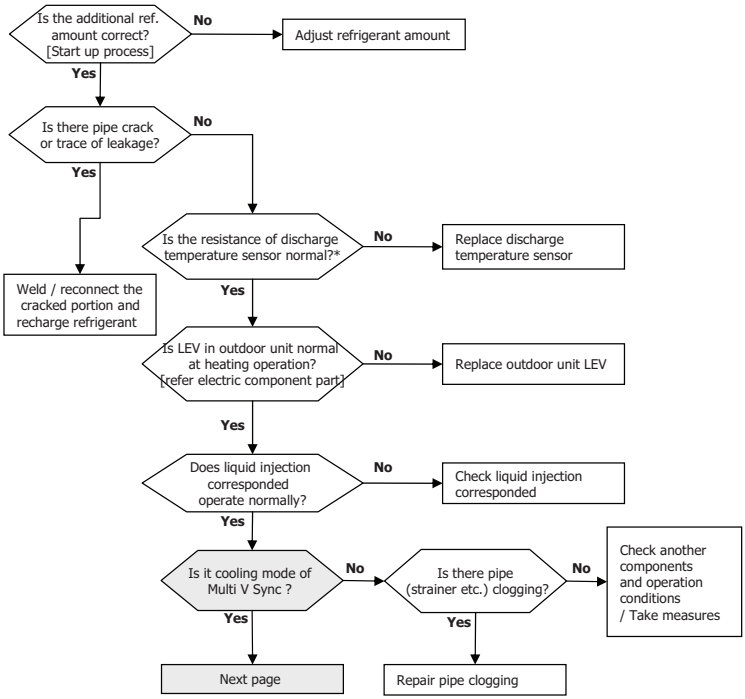




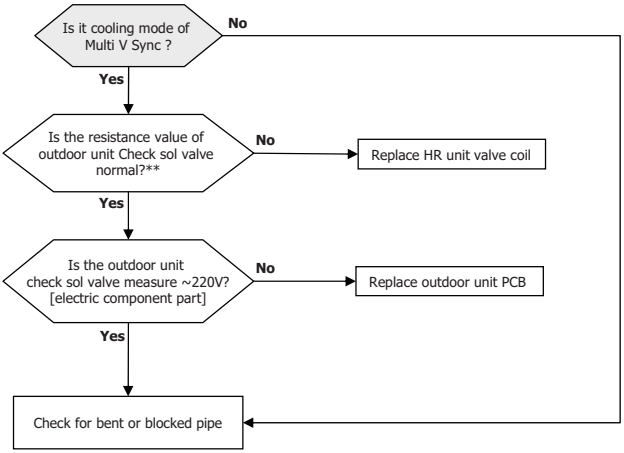


Error Code	Error Contents	Meaning	Main Causes
32 (Plus Inv) Plus II : 321,322, 323,324 SPACE / Right Comp.(N1)	Over-increase discharge temperature of inverter compressor at main outdoor unit	Compressor is off because of over-increase discharge temperature of inverter compressor	1. Temperature sensor defect of inverter compressor discharge pipe 2. Refrigerant shortage / leak 3. LEV defect 4. Liquid injection valve defect 5. Check solenoid valve defect(Sync)
33 (Plus Main) Plus II : 331,332, 333,334 SPACE / Left Comp.(N2) plus 100,101(Sub1) 102,103(Sub2) 152,153(Sub3)	Over-increase discharge temperature of constant (Space:Inv.) compressor at main constant outdoor and sub constant outdoor unit	Compressor is off because of over-increase discharge temperature of constant (Space:Inv.) compressor at main and sub outdoor unit	1. Temperature sensor defect of constant (Space:Inv.) compressor discharge pipe? 2. Refrigerant shortage/leak 3. LEV defect 4. Liquid injection valve defect 5. Check solenoid valve defect(Sync)

Error diagnosis and countermeasure flow chart

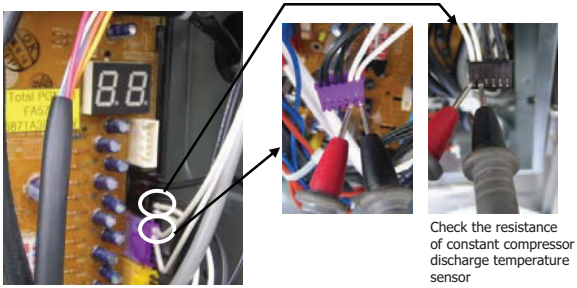


* Resistance value of discharge temperature sensor
10℃ = 362㏀, 25℃ = 200㏀, 50℃ = 82㏀, 100℃ = 18.5㏀

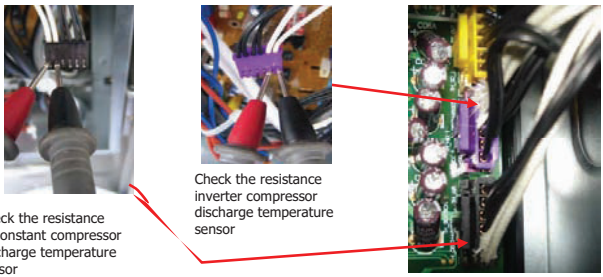

Is it cooling mode of Multi V Sync ?
No
Yes
Is the resistance value of outdoor unit Check sol valve normal?**
No
Replace HR unit valve coil
Yes
Is the outdoor unit check sol valve measure ~220V? [electric component part]
No
Replace outdoor unit PCB
Yes
Check for bent or blocked pipe

* Error is generated if the resistance is more than 5MΩ (open) and less than 2 kΩ (short)

Note: Standard values of resistance of sensors at different temperatures (±5% variation)
10℃ = 362kΩ : 25℃= 200kΩ : 50℃= 82kΩ : 100℃= 18.5kΩ

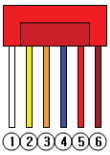
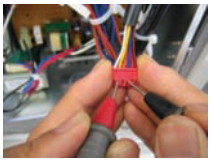
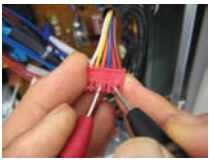
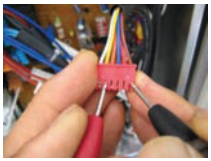
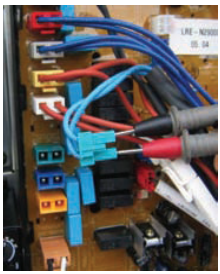
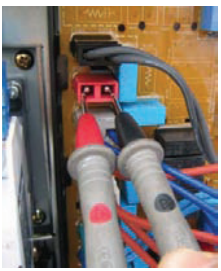


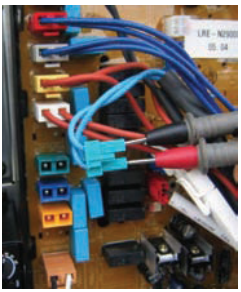
Check the resistance of constant compressor discharge temperature sensor



Check the resistance inverter compressor discharge temperature sensor

Check the resistance of constant compressor discharge temperature sensor

Check Loc.	Check points
Check outdoor unit LEV 	① - ③ : around 300Ω  ② - ④ : around 300Ω ① - ⑤ : around 150Ω  ③ - ⑤ : around 300Ω  ② - ⑥ : around 300Ω ④ - ⑥ : around 150Ω
Hot gas by pass Valve Connector resistance 1.85 kΩ(±10%)	
Liquid by pass valve Connector resistance 1.85 kΩ(±10%)	

Check Loc.	Check points
Hot gas by pass Valve Connector resistance 1.85 kΩ(±10%)	
Liquid by pass valve Connector resistance 1.85 kΩ(±10%)	

* Calculation of additional refrigerant amount

R410A Multi V Plus, Plus II & Space			R410A Multi V Sync		
Ⓐ	Product Charge(kg)		Ⓐ	Product charge(1unit)	
Ⓑ	Additional charge (kg)		Ⓑ	Additional charge (kg)	
=	Total liquid pipe (m): Ø22.2mm	x 0.354(kg/m)	=	Total liquid pipe (m): Ø22.2mm	x 0.354(kg/m)
+	Total liquid pipe (m): Ø19.05mm	x 0.266(kg/m)	+	Total liquid pipe (m): Ø19.05mm	x 0.266(kg/m)
+	Total liquid pipe (m): Ø15.88mm	x 0.173(kg/m)	+	Total liquid pipe (m): Ø15.88mm	x 0.173(kg/m)
+	Total liquid pipe (m): Ø12.7mm	x 0.118(kg/m)	+	Total liquid pipe (m): Ø12.7mm	x 0.118(kg/m)
+	Total liquid pipe (m): Ø9.52mm	x 0.061(kg/m)	+	Total liquid pipe (m): Ø9.52mm	x 0.061(kg/m)
+	Total liquid pipe (m): Ø6.35mm	x 0.022(kg/m)	+	Total liquid pipe (m): Ø6.35mm	x 0.022(kg/m)
+	CF(kg) (Correction Factor)		+	Number of installed HR units	x 0.5 kg(4 Rooms)
	Total amount(kg)	= Ⓐ + Ⓑ	+	CF(kg) (Correction factor)	
				Total amount(kg)	= Ⓐ + Ⓑ
⚠ CAUTION If a negative result is obtained from the calculation, no refrigerant needs to be added.			⚠ CAUTION If a negative result is obtained from the calculation, no refrigerant needs to be added.		

* R410A Correction Factor(CF)

Multi V Plus, Plus II

• **Cooling Only**

HP	5	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
Product Charge(kg)	4	4.5	6	8	8	8	16	16	16	16	16	24	24	24	24	24	24	24	24
CF(kg)	0	0	-1	0	1	2	-2	-1	0	1	2	-2	-1	0	1	2	3	4	5

• **Heat Pump**

HP	5	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
Product Charge(kg)	4	4.5	8	8	8	8	16	16	16	16	16	24	24	24	24	24	24	24	24
CF(kg)	0	0	-1	0	1	2	-2	-1	0	1	2	-2	-1	0	1	2	3	4	5

Multi V Space

System(HP)		5	10
Model		ARUN508RV0 ARUN508LV0	ARUN1008F20
Product Charge	kg	4.7	9.5

Multi V Sync

HP	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
Product Charge(kg)	8	8	8	8	16	16	16	16	16	24	24	24	24	24	24	24	24
CF(kg)	-1	0	1	2	-2	-1	0	1	2	-2	-1	0	1	2	3	4	5

* Calculation of additional refrigerant amount

R22 Multi V Plus

Ⓐ Product Charge(kg)

Ⓑ Additional charge (kg)

= Total liquid pipe (m): Ø22.2mm x 0.4(kg/m)

\+ Total liquid pipe (m): Ø19.05mm x 0.3(kg/m)

\+ Total liquid pipe (m): Ø15.88mm x 0.2(kg/m)

\+ Total liquid pipe (m): Ø12.7mm x 0.12(kg/m)

\+ Total liquid pipe (m): Ø9.52mm x 0.06(kg/m)

\+ Total liquid pipe (m): Ø6.35mm x 0.025(kg/m)

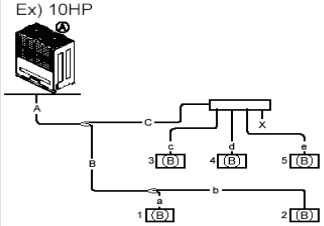
\+ CF(kg) (Correction Factor)

Total amount(kg) = Ⓐ + Ⓑ

CAUTION

► Refer to Outdoor Units Information due to differ CF(Correction Factor) as the Outdoor Units

Ex) 10HP



Ⓐ Outdoor Unit
Ⓑ Indoor Unit
A : ø12.7, 60m
B : ø9.52, 20m
C : ø12.7, 20m
a : ø6.35, 10m
b : ø6.35, 10m
c : ø6.35, 10m
d : ø6.35, 10m
e : ø6.35, 10m

Additional Charge = A x 0.12 + B x 0.06 + C x 0.12 + (a+b+c+d+e) x 0.025 + CF
= 60 x 0.12 + 20 x 0.06 + 20 x 0.12 + (10 x 5) x 0.025 + (-1) (CF)
= 11.05 (kg)

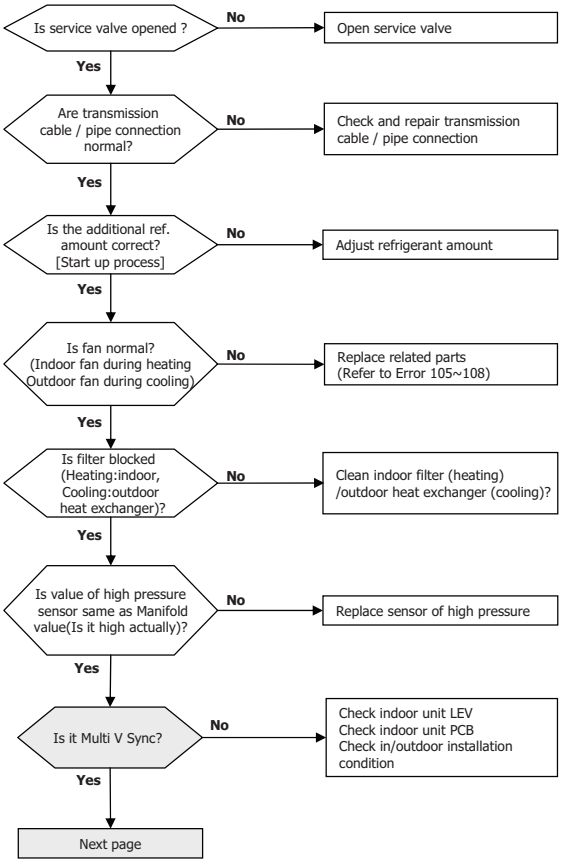
* R22 Correction Factor(CF)

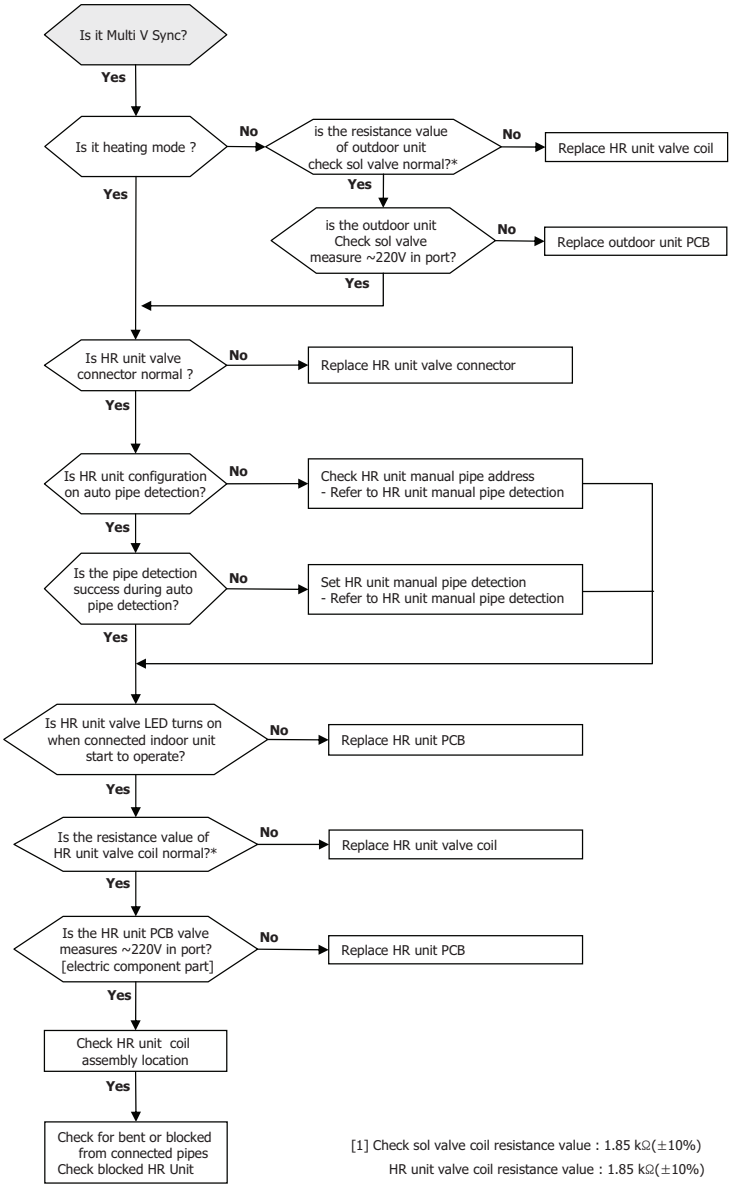
HP		5	6	8	10	12	14	16	18	20
Heat Pump	Product(kg)	4	4.5	10	10	10	10	20	20	20
	CF(kg)	0	0	-3	-2	-1	-1	-2	-2	-2
Cool Only	Product(kg)	4	4.5	6(380V) 10(220V)	10	10	10	20	20	20
	CF(kg)	0	0	0(380V) -3(220V)	-2	-1	-1	-2	-2	-2

HP		22	24	26	28	30	32	34	36	38	40
Heat Pump	Product(kg)	20	20	30(50Hz) 20(60Hz)	30	30	30	30	30	30	30
	CF(kg)	-2	-2	0(50Hz) -1(60Hz)	0	0	0	1	1	2	2
Cool Only	Product(kg)	20	20	30(50Hz) 20(60Hz)	30	30	30	30	30	30	30
	CF(kg)	-2	-2	0(50Hz) -1(60Hz)	0	0	0	1	1	2	2

Error Code	Error Contents	Meaning	Main Causes
-Plus, Sync 34 (Main) 143 (Sub1) 145 (Sub2) 169 (Sub3) Plus II: 341,342, 343,344	Over-increase of discharge pressure of compressor	Error happens because of 3 times successive compressor off due to over-increase of high pressure by high pressure sensor	1. High pressure sensor defect 2. Indoor or outdoor unit fan defect 3. Deformation because of damage of refrigerant pipe 4. Over-charged refrigerant 5. Indoor / outdoor unit LEV defect 7. When blocked - Outdoor unit is blocked during cooling - Indoor unit filter is blocked during heating 8. SVC valve is clogged 9. PCB defect of outdoor unit 10. Indoor unit pipe temperature sensor defect

Error diagnosis and countermeasure flow chart

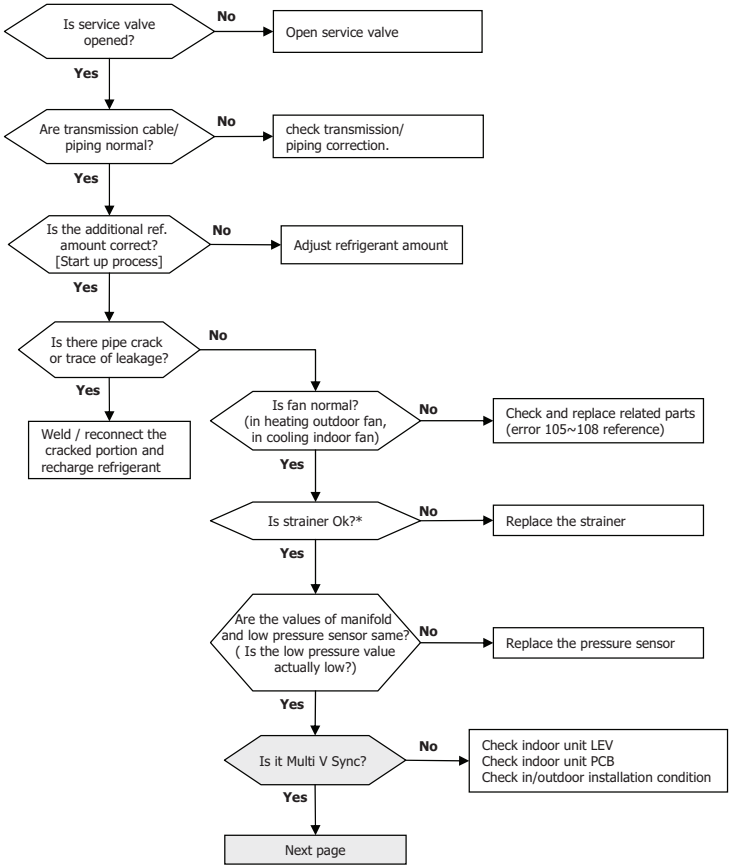


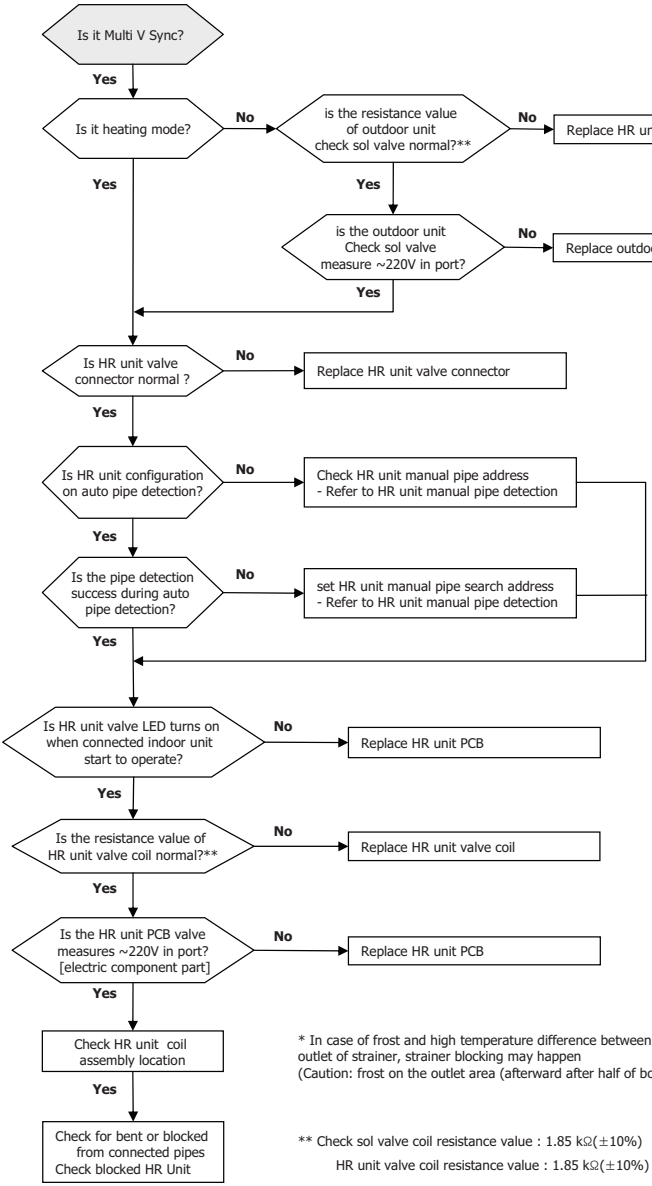

Is it Multi V Sync?
Yes
Is it heating mode ?
No
is the resistance value of outdoor unit check sol valve normal?*
No
Replace HR unit valve coil
Yes
is the outdoor unit Check sol valve measure ~220V in port?
No
Replace outdoor unit PCB
Yes
Is HR unit valve connector normal ?
No
Replace HR unit valve connector
Yes
Is HR unit configuration on auto pipe detection?
No
Check HR unit manual pipe address
- Refer to HR unit manual pipe detection
Yes
Is the pipe detection success during auto pipe detection?
No
Set HR unit manual pipe detection
- Refer to HR unit manual pipe detection
Yes
Is HR unit valve LED turns on when connected indoor unit start to operate?
No
Replace HR unit PCB
Yes
Is the resistance value of HR unit valve coil normal?*
No
Replace HR unit valve coil
Yes
Is the HR unit PCB valve measures ~220V in port? [electric component part]
No
Replace HR unit PCB
Yes
Check HR unit coil assembly location
Yes
Check for bent or blocked from connected pipes
Check blocked HR Unit

[1] Check sol valve coil resistance value : 1.85 kΩ(±10%)
HR unit valve coil resistance value : 1.85 kΩ(±10%)

Error No.	Error Contents	Meaning	Main Causes
-Plus, Sync 35 (Main) 144 (Sub1) 146 (Sub2) 170 (Sub3) -Plus II: 351,352, 353,354	Excessive drop of discharge pressure of compressor	Error happens because of 3 times successive compressor off due to excessive drop of low pressure by the low pressure sensor	1. Low pressure sensor defect 2. Outdoor/indoor unit fan defect 3. Refrigerant shortage/leakage 4. Deformation because of damage of refrigerant pipe 5. Indoor / outdoor unit LEV defect 6. Covering / clogging (outdoor unit covering during the cooling mode/ indoor unit filter clogging during heating mode) 7. SVC valve clogging 8. Outdoor unit PCB defect 9. Indoor unit pipe sensor defect 10. HR unit valve coil defect(Multi V Sync) 11. HR unit PCB defect(Multi V Sync)

Error diagnosis and countermeasure flow chart



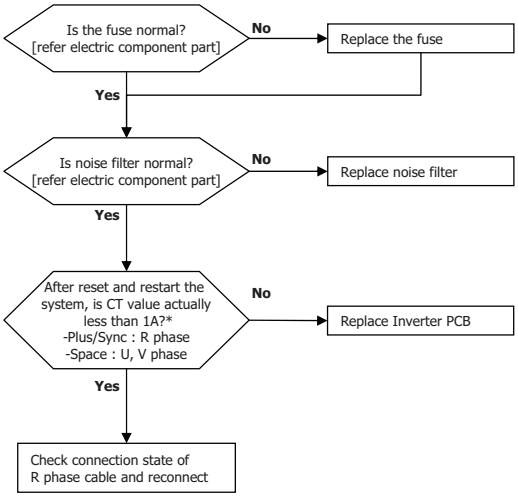

Is it Multi V Sync?
Yes
Is it heating mode?
No
is the resistance value of outdoor unit check sol valve normal?**
No
Replace HR unit valve coil
Yes
Yes
is the outdoor unit Check sol valve measure ~220V in port?
No
Replace outdoor unit PCB
Yes
Is HR unit valve connector normal ?
No
Replace HR unit valve connector
Yes
Is HR unit configuration on auto pipe detection?
No
Check HR unit manual pipe address
- Refer to HR unit manual pipe detection
Yes
Is the pipe detection success during auto pipe detection?
No
set HR unit manual pipe search address
- Refer to HR unit manual pipe detection
Yes
Is HR unit valve LED turns on when connected indoor unit start to operate?
No
Replace HR unit PCB
Yes
Is the resistance value of HR unit valve coil normal?**
No
Replace HR unit valve coil
Yes
Is the HR unit PCB valve measures ~220V in port? [electric component part]
No
Replace HR unit PCB
Yes
Check HR unit coil assembly location
Yes
Check for bent or blocked from connected pipes
Check blocked HR Unit

* In case of frost and high temperature difference between inlet and outlet of strainer, strainer blocking may happen
(Caution: frost on the outlet area (afterward after half of body)

** Check sol valve coil resistance value : 1.85 kΩ(±10%)
HR unit valve coil resistance value : 1.85 kΩ(±10%)

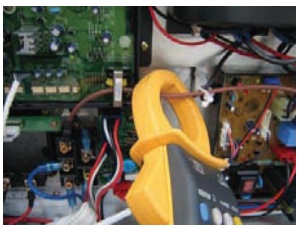
Error code			Error contents	Meaning	Main causes
Plus:40 Plus II: 401,402,403,404			Low current at CT or CT sensor defect	While inverter compressor operation R phase current drops below 1A or CT short	1. Fuse failure 2. Defective noise filter 3. R phase connection problem 4. CT sensor failure (inverter PCB failure)
SPACE	N1 40	Right Comp.			
	N2 40	Left Comp.			

Error diagnosis and countermeasure flow chart

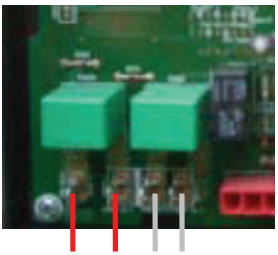


* Measure the CT current with clamp meter

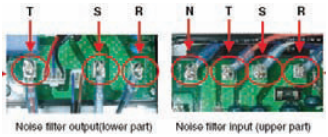
- Multi V PLUS / Sync : R phase



-Multi V SPACE : U(+), U(-), V(+), V(-)
The current difference among phases is less than 0.5A ±10%

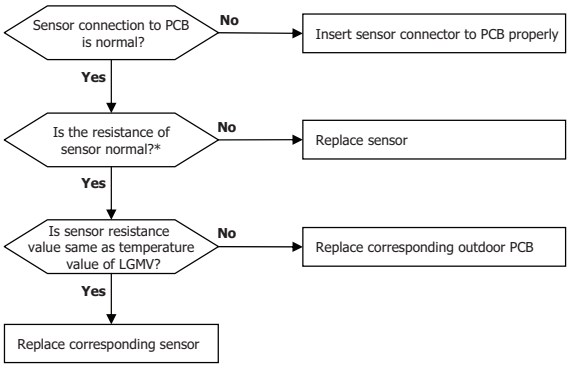


FUSE (Protect over-loaded current) (plus)	Check disconnection of FUSE (when power is supplied)	- Voltage of fuse should be within 0~1V Checking points of R ϕ fuse	-In case of 220V, Fuse is disconnected. → Replace FUSE
	Check disconnection of FUSE (when power is not supplied)	-Resistance of fuse should be within 0~1Ω	-In case resistance is ∞, Fuse is disconnected. → Replace FUSE

Nose filter (Noise emit & protect)	Check voltage (when power is Supplied)	-Voltage of each connector (R-R,S-S,T-T) should be within 0~40V (Plus) (Plus II)  Noise filter output(lower part) Noise filter input (upper part)	- In case of 220V It is disconnected → Replace noise filter
	Check Ω (When power Is not supplied)	-Resistance of each connectors (R-R,S-S,T-T) should be within 0~10Ω	-In case resistance is ∞, noise filter is disconnected. → Replace noise filter

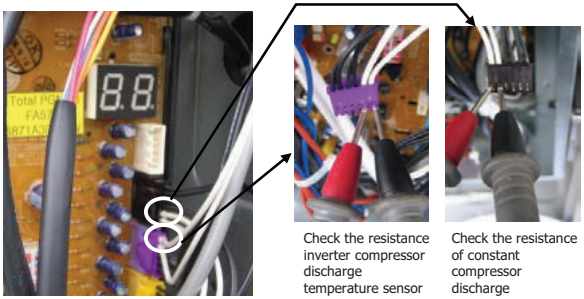
Error code		Error contents	Meaning	Main causes
Plus:41 (Main inverter compressor) Plus II:411,412,413,414		Compressor discharge pipe temperature sensor error	Sensor measurement valve is abnormal (Open/Short)	1. Connection of the compressor defect discharge pipe temperature sensor 2. Discharge pipe compressor sensor of the compressor (open/short) defect 3. Outdoor PCB defect
SPACE	Right Comp.(N1)			
Plus: 47 (Main constant compressor) 121 (Sub1 constant compressor 1) 122 (Sub1 constant compressor 2) 133 (Sub2 constant compressor 1) 134 (Sub2 constant compressor 2) 162 (Sub3 constant compressor 1) 163 (Sub3 constant compressor 2) Plus II: 471,472,473,474 (Constant compress)				

Error diagnosis and countermeasure flow chart



* Error is generated if the resistance is more than 5MΩ (open) and less than 2 kΩ (short)

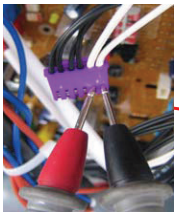
Note: Standard values of resistance of sensors at different temperatures (±5% variation)
10℃ = 362kΩ : 25℃= 200kΩ : 50℃= 82kΩ : 100℃= 18.5kΩ



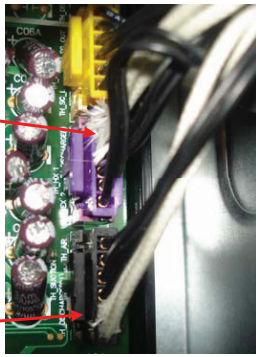
Check the resistance inverter compressor discharge temperature sensor

Check the resistance of constant compressor discharge temperature sensor

Check the resistance of constant compressor discharge temperature sensor



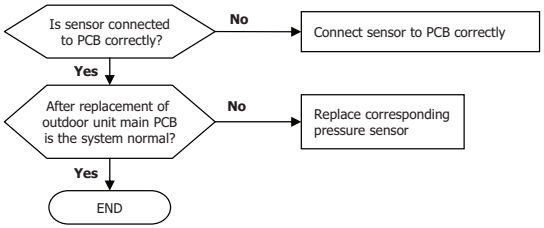
Check the resistance inverter compressor discharge temperature sensor

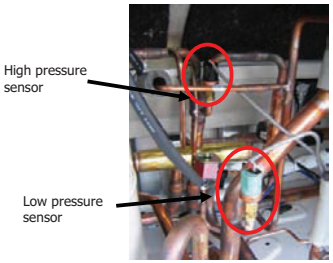


Error code	Error contents	Meaning	Main causes
Plus: 42 (Main) 117 (Sub1) 129 (Sub2) 158 (Sub3) Plus II: 421,422,423,424	Sensor error of low pressure	Abnormal value of sensor (Open/Short)	1. Bad connection of low pressure connector 2. Low pressure connector defect (Open/Short) 3. Outdoor PCB defect

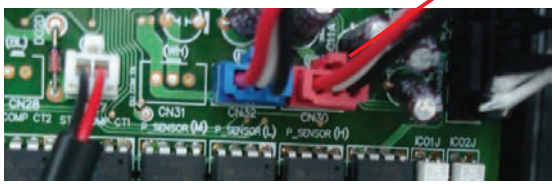
Error code	Error contents	Meaning	Main causes
Plus: 43 (Main) 116 (Sub1) 128 (Sub2) 157 (Sub3) Plus II: 431,432,433,434	Sensor error of high pressure	Abnormal value of sensor (Open/Short)	1. Bad connection of high pressure connector 2. High pressure connector defect(Open/Short) 3. Outdoor PCB defect

Error diagnosis and countermeasure flow chart





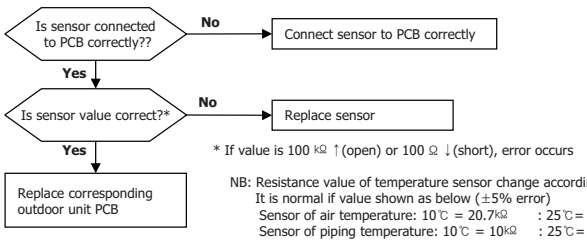
Plus model



Plus II model

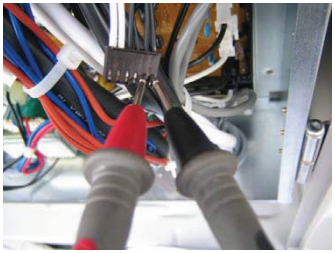
Error code	Error contents	Meaning	Main causes
Plus: 44 (Main) 118 (Sub1) 130 (Sub2) 159 (Sub3) Plus II: 441,442, 443,444	Sensor error of outdoor air temperature	Abnormal value of sensor (Open/Short)	1. Bad connection of air temperature connector 2. Air temperature connector defect(Open/Short) 3. Outdoor PCB defect
Plus: 45 (Main H/E A) 48 (Main H/E B) 123 (Sub1 H/E A) 124 (Sub1 H/E B) 135 (Sub2 H/E A) 136 (Sub2 H/E B) 164 (Sub3 H/E A) 165 (Sub3 H/E B) Plus II: 451,452, 453,453(H/E A) 481,482, 483,484(H/E B)	Piping temperature sensor error of heat exchanger in main & sub outdoor unit heat exchanger (A,B)	Abnormal value of sensor (Open/Short)	1. Bad connection of air temperature connector 2. Air temperature connector defect(Open/Short) 3. Outdoor PCB defect
Plus: 46 (Main) 120 (Sub1) 132 (Sub2) 161 (Sub3) Plus II: 461,462, 463,464	Compressor suction temperature sensor error	Abnormal value of sensor (Open/Short)	1. Bad connection of air temperature connector 2. Air temperature connector defect(Open/Short) 3. Outdoor PCB defect
Plus:47 (constant compressor of main outdoor unit) Plus II: 471,472,473,474 SPACE: Left Comp.(N2)	Discharge piping temperature sensor error of constant(Space: Inv.) compressor (Main unit)	Abnormal value of sensor (Open/Short)	Refer to CH41
Plus:48 (Heat exchanger B)	Piping temperature sensor error of heat exchanger in main & sub outdoor unit heat exchanger (B)	Abnormal value of sensor (Open/Short)	Refer to CH45

Error diagnosis and countermeasure flow chart

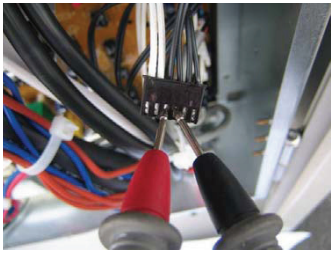


* If value is 100 kΩ ↑(open) or 100 Ω ↓(short), error occurs

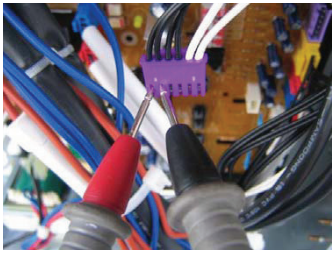
NB: Resistance value of temperature sensor change according to temperature
It is normal if value shown as below (±5% error)
Sensor of air temperature: 10℃ = 20.7kΩ : 25℃= 10kΩ : 50℃= 3.4kΩ
Sensor of piping temperature: 10℃ = 10kΩ : 25℃= 5kΩ : 50℃= 1.8kΩ



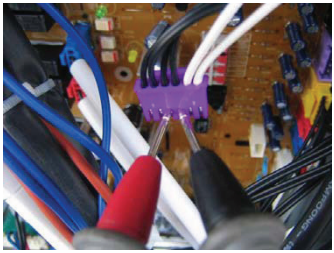
Measure resistance of outdoor air temperature sensor



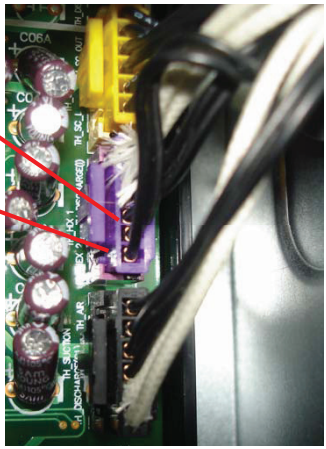
Measure resistance of outdoor suction pipe temperature sensor



Measure resistance of outdoor HEX(A) temperature sensor



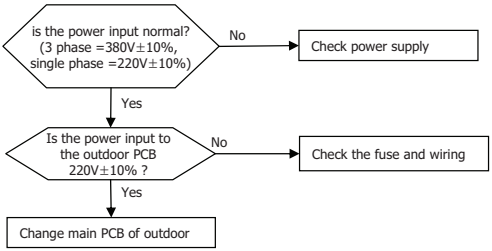
Measure resistance of outdoor HEX(B) temperature sensor



Plus II model

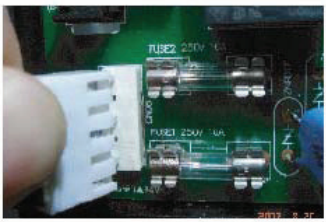
Error Code	Error Contents	Meaning	Main Causes
(plus) 49 (Main) 148(Sub1) 150(Sub2) 172(Sub3)	Outdoor voltage sensing error	The measured value of the sensor is not normal(Open/Short)	1. Abnormal input voltage 2. Outdoor line fuse damage 3. Outdoor main PCB defect

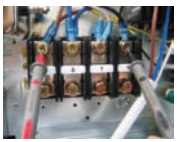
Error diagnosis and countermeasure flow chart



* Check Line Fuse of MAIN PCB(Plus)

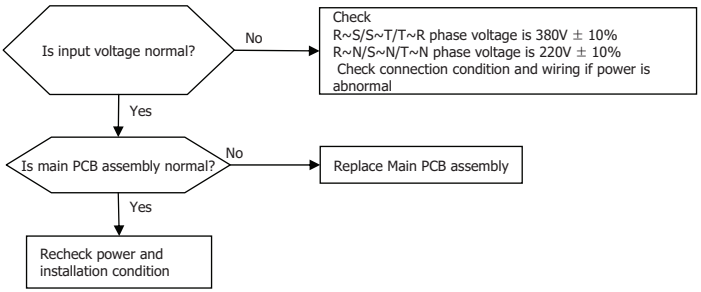
* Check Line Fuse of MAIN PCB(Plus II)



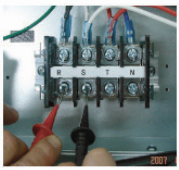
Part (Function)	Check points	How to check?	Counter-measure
T/BLOCK (Terminal Block, Input power)	Check voltage	- Voltage of 3ϕ(R,S,T) should be within 380±10% - Voltage of 1ϕ(R-N,S-N,T-N) should be within 220±10%. - Voltage fluctuation should be within 10V - While stand-by and in operation, Voltage drop should be within 10V  Checking points of 3ϕ(R-S) Checking points of 1ϕ(R-N)	-Check supply power and connection condition
	Check Ω (In case power is not supplied)	- Resistance of R-S,S-T,R-T,R-N,S-N should be more than a few kΩ - Resistance of T-N should be within 40~50Ω (Main transformer of outdoor)	-Check short or not of Control box (Noise filter, PCB, cables) - Replace transformer

Error Code	Error Contents	Meaning	Main Causes
(Plus II) 501,502, 503,504	ODU 3phase power omission error	Omitting one or more of R,S,T input power	1. Input Voltage abnormal (R,S,T,N) 2. Check power Line connection condition 3. Main PCB damage

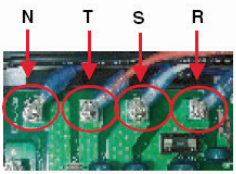
Error diagnosis and countermeasure flow chart

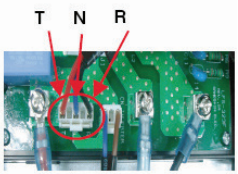


* Measuring input voltage

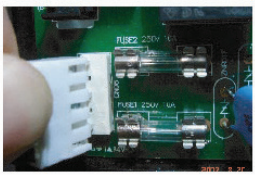


* Noise filter wiring



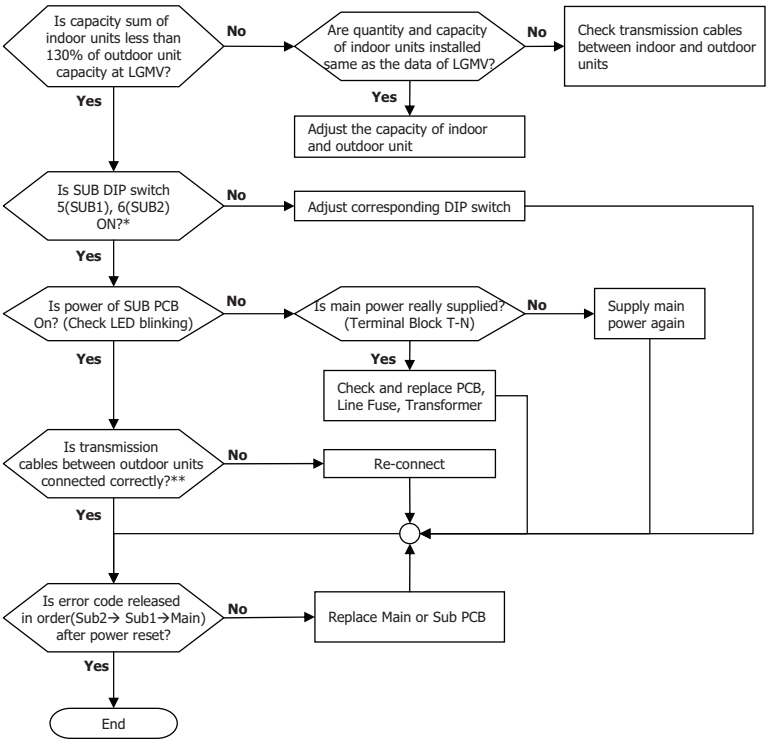


* Main PCB power connection

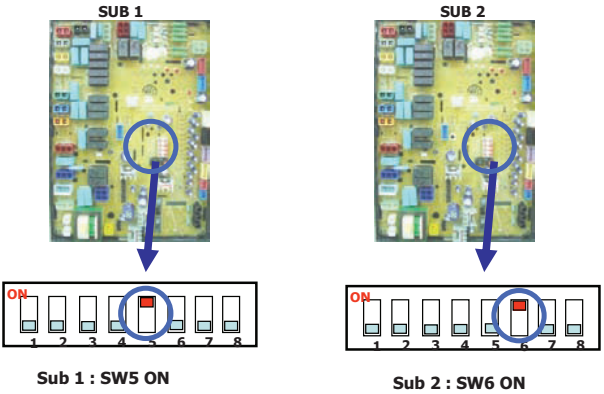


Error Code	Error Contents	Meaning	Main Causes
Plus:51 Plus II:511	Over-Capacity (Sum of indoor unit capacity is more than outdoor capacity)	Sum of indoor unit capacity exceed outdoor unit capacity specification	1. 130% more than outdoor unit rated capacity 2. Wrong connection of transmission cable/piping 3. Control error of sub outdoor unit DIP switch 4. Power supply defect of Sub unit PCB 5. Outdoor unit PCB defect

Error diagnosis and countermeasure flow chart


Is capacity sum of indoor units less than 130% of outdoor unit capacity at LGMV?
No
Are quantity and capacity of indoor units installed same as the data of LGMV?
No
Check transmission cables between indoor and outdoor units
Yes
Yes
Adjust the capacity of indoor and outdoor unit
Is SUB DIP switch 5(SUB1), 6(SUB2) ON?*
No
Adjust corresponding DIP switch
Yes
Is power of SUB PCB On? (Check LED blinking)
No
Is main power really supplied? (Terminal Block T-N)
No
Supply main power again
Yes
Yes
Check and replace PCB, Line Fuse, Transformer
Is transmission cables between outdoor units connected correctly?**
No
Re-connect
Yes
Is error code released in order(Sub2→ Sub1→Main) after power reset?
No
Replace Main or Sub PCB
Yes
End

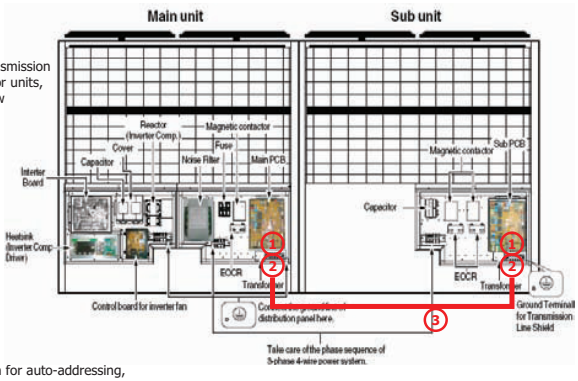
* Dip switch setting of SUB unit(Plus)



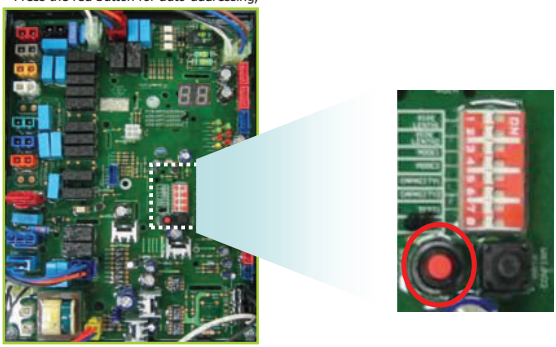
Sub 1 : SW5 ON

Sub 2 : SW6 ON

** In order to check transmission cables between outdoor units, check in order as below
: PCB connectors →
terminal block →
transmission cables

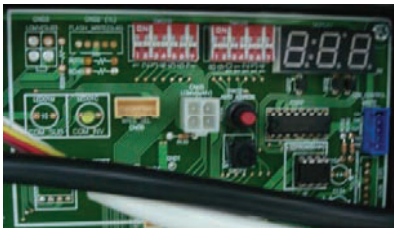


*** Press the red button for auto-addressing,

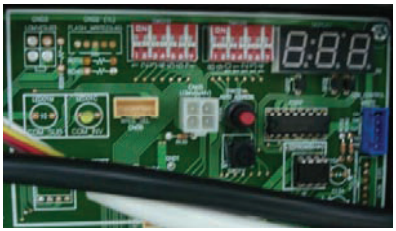


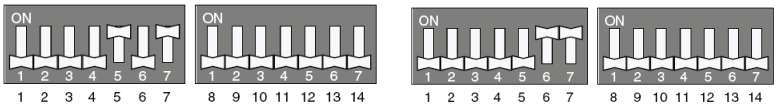
* Dip switch setting of SUB unit (Plus II)

SUB1

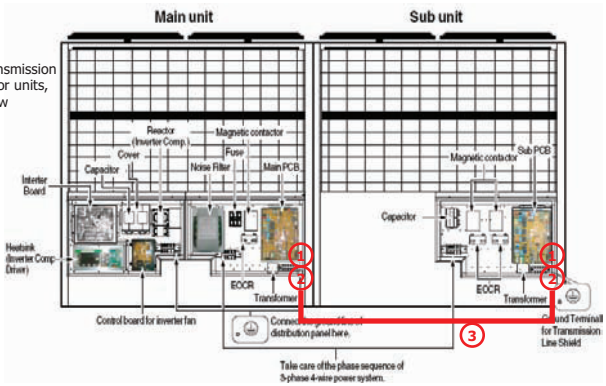


SUB2

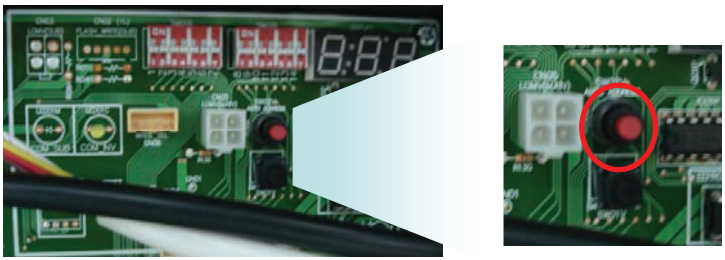




** In order to check transmission cables between outdoor units, check in order as below
: PCB connectors → terminal block → transmission cables

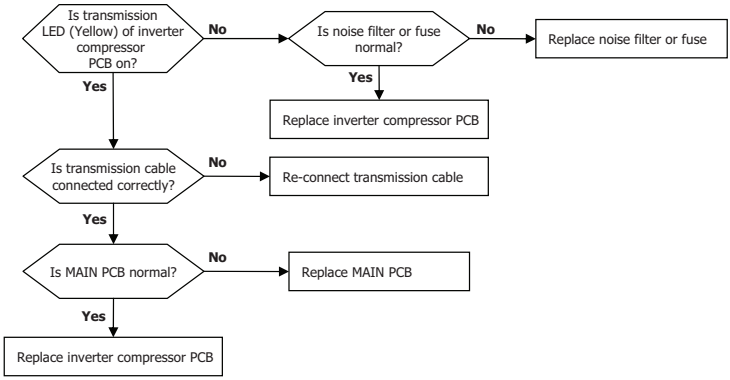


*** Press the red button for auto-addressing,



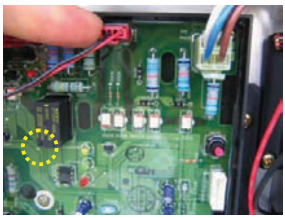
Error Code			Error Contents	Meaning	Main Causes
Plus:52 Plus II:521,522, 523,524			Transmission error between (Inverter PCB → Main PCB)	Main controller can't receive signal from inverter controller	1. Power cable or transmission cable is not connected 2. Defect of outdoor Main fuse/Noise Filter 3. Defect of outdoor Main / inverter PCB
SPACE	N1 52	Right Comp.			
	N2 52	Left Comp.			

Error diagnosis and countermeasure flow chart

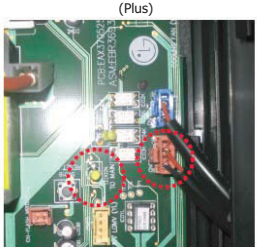


* The method of checking MAIN PCB and inverter compressor PCB (If normal, transmission LED blinks)
(Refer electrical component part for Multi V Space)

- Transmission connector & LED in inverter compressor PCB

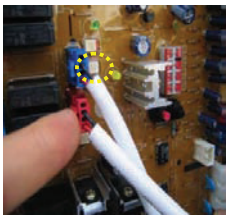


(Plus)

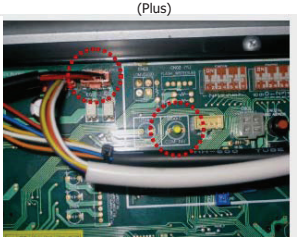


(Plus II)

- Transmission connector & LED in MAIN PCB



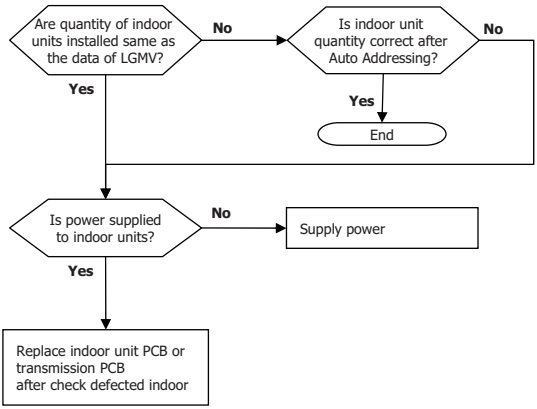
(Plus)



(Plus II)

Error code	Error Contents	Meaning	Main Causes
Plus:53 Plus II: 531,532, 533,534	Transmission error (Indoor unit → Main PCB)	In case Main PCB can't receive signal from indoor unit	1. Transmission cables are not connected 2. Transmission cables are short or open 3. No addressing after changing indoor unit PCB 4. Outdoor Main PCB or indoor PCB defect

Error diagnosis and countermeasure flow chart



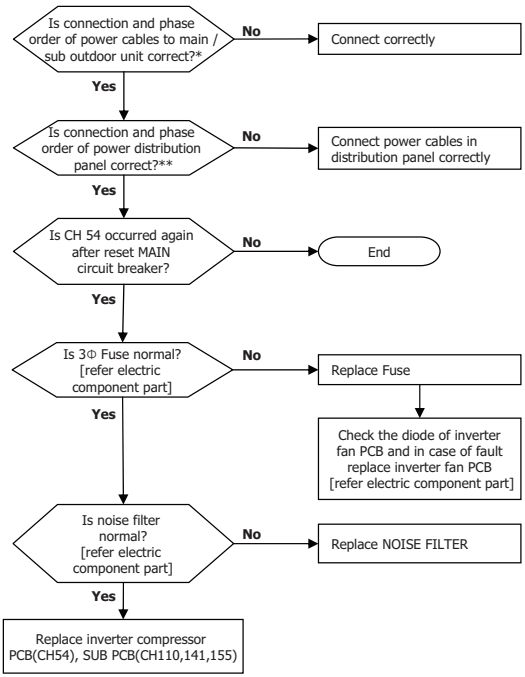
In case of CH53, almost happened with CH05, the indoor units not operated actually are normal so check with same method of CH05. and additionally check as shown as below and above flow chart

- Although the quantity of indoor units installed is same as LGMV data there may be a few indoor units with which the number of transmission is not increased with LGMV
- Although the quantity of indoor units installed is not same as LGMV data, and if transmission of the indoor unit displayed at LGMV is done well then the indoor unit suspected to have some problem (and is not appear at LGMV) may have following problems
  ① wrong connection of transmission cable or power cable
  ② fault of power / PCB / transmission cable
  ③ duplication of indoor unit number
- If transmission is not doing well wholly then the Auto Addressing is not done
- The case that CH53 appear at indoor unit also Auto Addressing is not done so indoor unit address may be duplicated

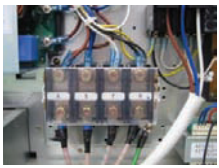
*After replacement of indoor unit PCB, Auto Addressing should be done, if central controller is installed then the central control address also should be input.
in case that only transmission PCB is replaced above process is not needed

Error code	Error Contents	Meaning	Main Causes
Plus: 54 (Main) 110 (Sub1) 141 (Sub2) 155 (Sub3) Plus II: 541,542, 543,544	Wrong connection of 3Φ power supply cable (Reverse direction / missing a phase)	Wrong connection of 3Φ power supply cable (Reverse direction / missing a phase)	1. Inverter PCB defect 2. No power of R, S, T supplied 3. Wrong connection of R, S, T cables 4. Main fuse defect

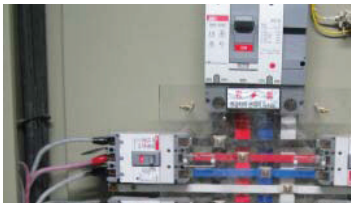
Error diagnosis and countermeasure flow chart

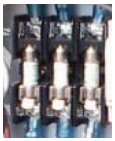

Is connection and phase order of power cables to main / sub outdoor unit correct?*
No
Connect correctly
Yes
Is connection and phase order of power distribution panel correct?**
No
Connect power cables in distribution panel correctly
Yes
Is CH 54 occurred again after reset MAIN circuit breaker?
No
End
Yes
Is 3Φ Fuse normal? [refer electric component part]
No
Replace Fuse
Check the diode of inverter fan PCB and in case of fault replace inverter fan PCB [refer electric component part]
Yes
Is noise filter normal? [refer electric component part]
No
Replace NOISE FILTER
Yes
Replace inverter compressor PCB(CH54), SUB PCB(CH110,141,155)

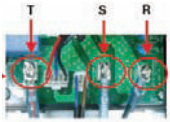
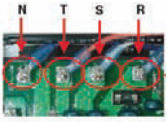
* Check power cable connection state, phase (R-S-T) order, power supply state in control box of product



**Check power cable connection state, phase order, power supply state in distribution panel

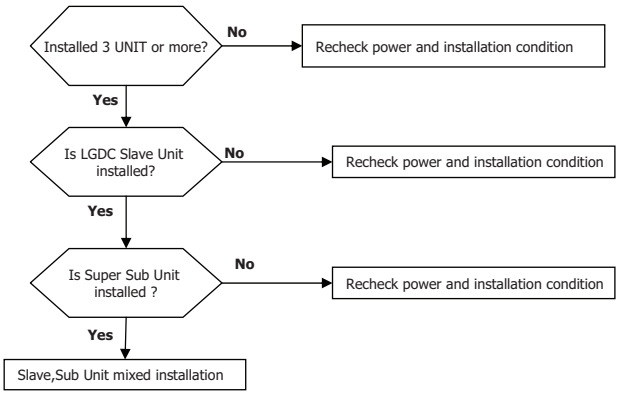


FUSE (Protect over-loaded current) (plus)	Check disconnection of FUSE (when power is supplied)	- Voltage of fuse should be within 0~1V  Checking points of R ϕ fuse	-In case of 220V, Fuse is disconnected. → Replace FUSE
	Check disconnection of FUSE (when power is not supplied)	-Resistance of fuse should be within 0~1Ω	-In case resistance is ∞, Fuse is disconnected. → Replace FUSE

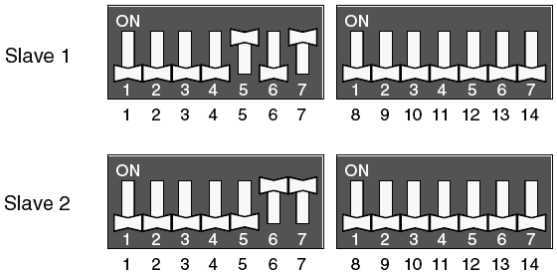
Nose filter (Noise emit & protect)	Check voltage (when power is Supplied)	-Voltage of each connector (R-R,S-S,T-T) should be within 0~40V (Plus) (Plus II)  Noise filter output(lower part)  Noise filter input (upper part)	- In case of 220V It is disconnected → Replace noise filter
	Check Ω (When power Is not supplied)	-Resistance of each connectors (R-R,S-S,T-T) should be within 0~10Ω	-In case resistance is ∞, noise filter is disconnected. → Replace noise filter

Error code	Error Contents	Meaning	Main Causes
Plus II: 591	Slave ODU mixed installation	Installing old Sub ODU and new slave ODU together	1Installing LGDC Slave Unit and Super sub Unit together

Error diagnosis and countermeasure flow chart

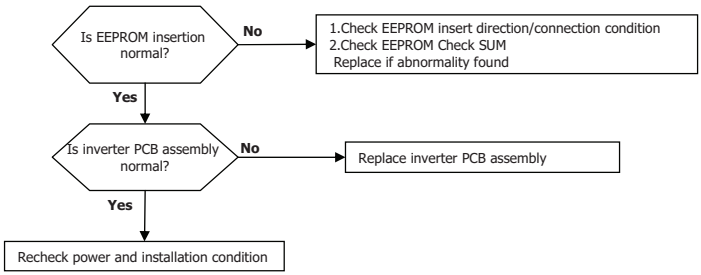


※ Slave Unit Dip S/W Setting

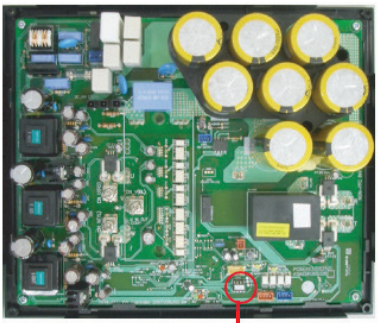


Error code	Error Contents	Meaning	Main Causes
Plus II: 601,602, 603,604	Inverter PCB EEPROM error	EEPROM Access error and Check SUM error	1. EEPROM contact defect/wrong insertion 2. Different EEPROM Version 3. ODU inverter PCB assembly damage

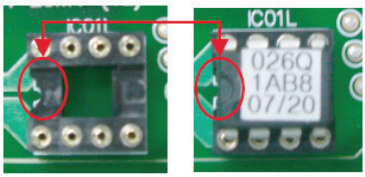
Error diagnosis and countermeasure flow chart



Inverter EEPROM



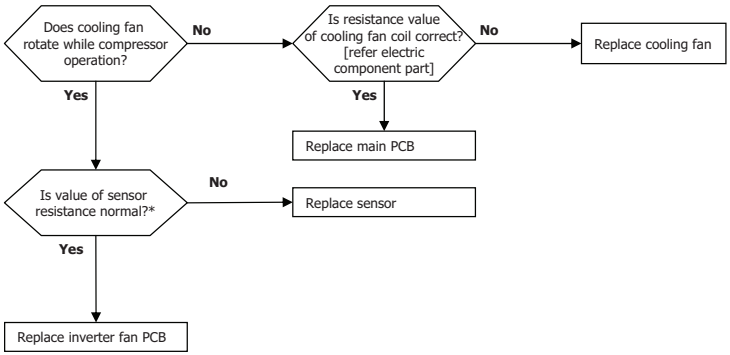
* Right inserting direction of inverter EEPROM



※ Note : Replace after power off

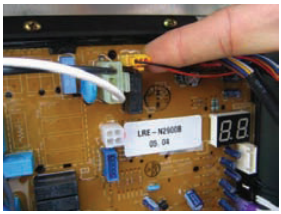
Error code	Error Contents	Meaning	Main Causes
Plus: 62	Heat sink over heat	Heat sink over heat	1. Defect of heat sink cooling fan 2. Defect of inverter compressor PCB 3. Loose connection of connector of cooling fan 4. Defect of temperature sensor of heat sink

Error diagnosis and countermeasure flow chart

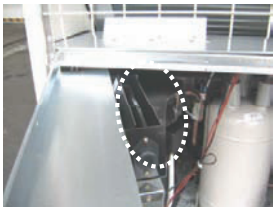


* Heat sink temperature sensor (±5% tolerance) : 10℃ = 20.0kΩ : 25℃= 10.0kΩ : 50℃= 3.5kΩ : 85℃= 1.0kΩ

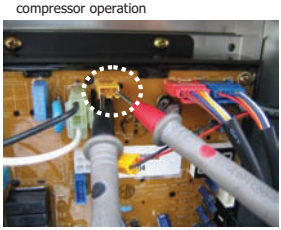
- Position of cooling fan drive connector in main PCB



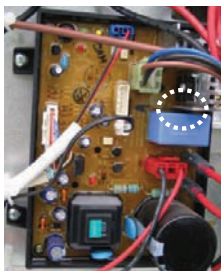
- Heat sink cooling fan



- Check DC 12V output during inverter compressor operation

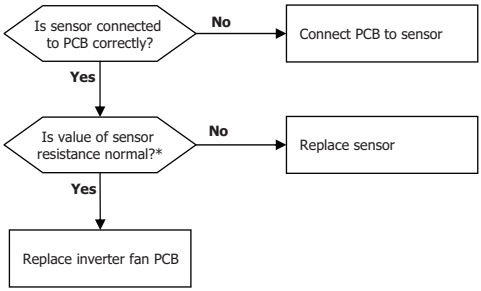


- Heat sink temperature sensor connection



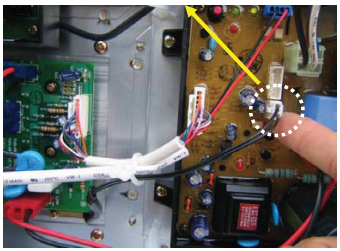
Error code	Error Contents	Meaning	Main Causes
Plus: 65	Heat sink temperature sensor error of inverter control PCB	Abnormal value of sensor (Open/Short)	1. Loose connection of temperature sensor connector 2. Temperature sensor defect (Open/Short) 2. Fan Main PCB defect

Error diagnosis and countermeasure flow chart

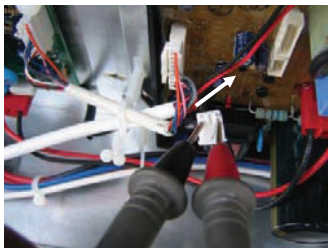


* If value is 100 kΩ ↑(open) or 100 Ω ↓(short), error occurs
NB: Resistance value of temperature sensor change according to temperature
It is normal if value shown as below (±5% error)
Heat sink sensor(±5% tolerance) : 10℃ = 20.0kΩ : 25℃= 10.0kΩ : 50℃= 3.5kΩ : 85℃= 1.0kΩ

- Temperature sensor location of Heat sink

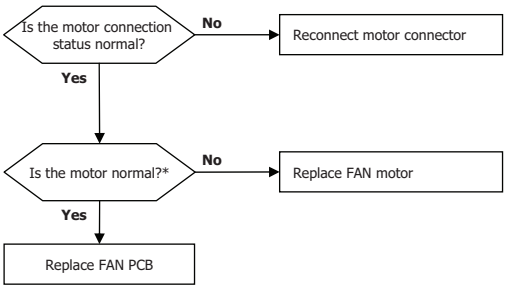


- Measure the resistance of heat sink temperature sensor



Error code			Error Contents	Meaning	Main Causes
Plus II: 671,672,673,673			Outdoor unit FAN LOCK error	Fan RPM is 10RPM or less for 5 sec. when ODU fan starts or 40 RPM or less after fan starting.	1. Fan motor defect / assembly condition abnormal 2. Wrong connection of fan motor connector (Hall sensor, U,V,W output) 3. Reversing rotation after RPM target apply 4. Fan PCB assembly defect
SPACE	N1 67	Right Fan		After FAN drive signal If the HALL SENSOR signal does not come on for 4 sec.	1. Motor connection defect 2. FAN PCB defect 3. Motor defect
	N2 67	Left Fan			

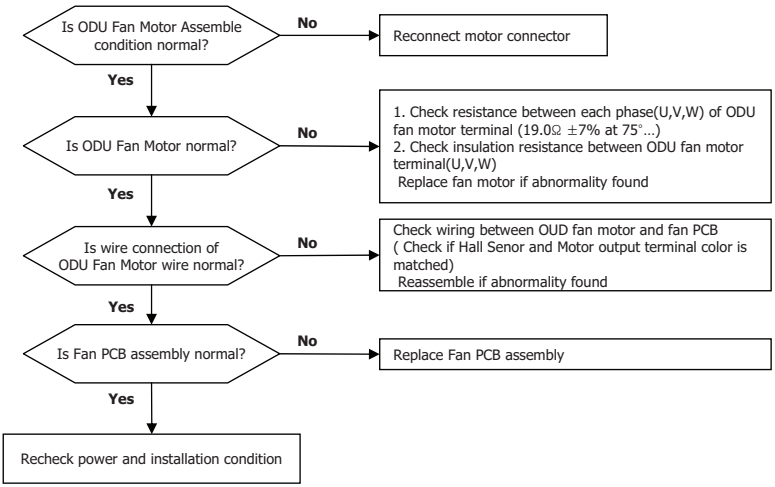
Error diagnosis and countermeasure flow chart(Plus)



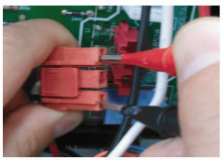
* Check Hall sensor of BLDC FAN motor Ha(4),Hb(3) ←-→ Gnd(2) : 24MOhm
Ha(4),Hb(3) ←-→ Vcc(1) : 11KOhm

* Check resistance of LGDC FAN motor power wire 19.0Ω±7% (75℃)

Error diagnosis and countermeasure flow chart(Plus II)


Is ODU Fan Motor Assemble condition normal?
No
Reconnect motor connector
Yes
Is ODU Fan Motor normal?
No
1. Check resistance between each phase(U,V,W) of ODU fan motor terminal (19.0Ω ±7% at 75°...)
2. Check insulation resistance between ODU fan motor terminal(U,V,W)
Replace fan motor if abnormality found
Yes
Is wire connection of ODU Fan Motor wire normal?
No
Check wiring between OUD fan motor and fan PCB
(Check if Hall Senor and Motor output terminal color is matched)
Reassemble if abnormality found
Yes
Is Fan PCB assembly normal?
No
Replace Fan PCB assembly
Yes
Recheck power and installation condition

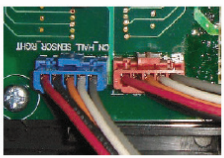
* Fan Motor resistance measuring between each phase



resistance

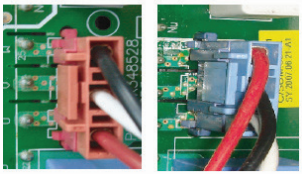
19.0Ω±7% (75℃)

* Hall Sensor connector



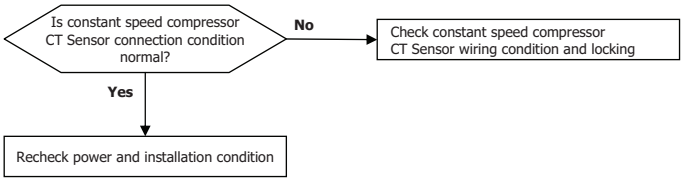
* Check Hall sensor of LGDC FAN motor

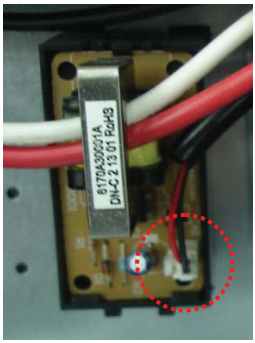
* Fan Motor Wire connection

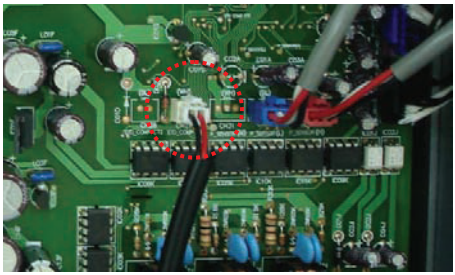


Error code	Error Contents	Meaning	Main Causes
Plus II: 701,702,703,704	Constant Speed Compressor CT Sensor Error	Constant Speed Compressor CT Sensor Open/short	Constant Speed Compressor CT Sensor defect

Error diagnosis and countermeasure flow chart

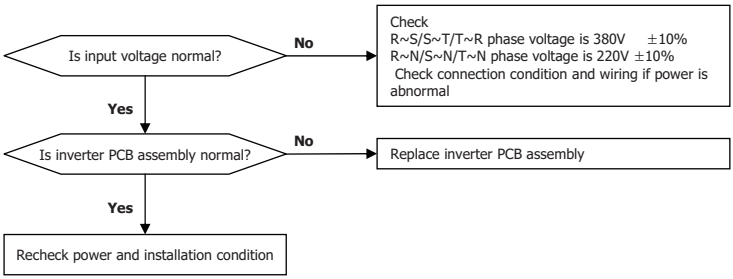

Is constant speed compressor CT Sensor connection condition normal?
No
Check constant speed compressor CT Sensor wiring condition and locking
Yes
Recheck power and installation condition



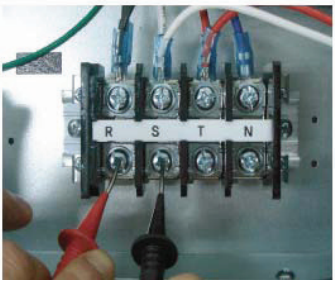


Error code	Error Contents	Meaning	Main Causes
Plus II: 711,712,713,714	Inverter input current CT sensor error	Micom input voltage isn't within 2.5V ±0.3V at initial state of power supply	1. Input voltage abnormal (T-N) 2. ODU inverter PCB damage (CT sensing part)

Error diagnosis and countermeasure flow chart

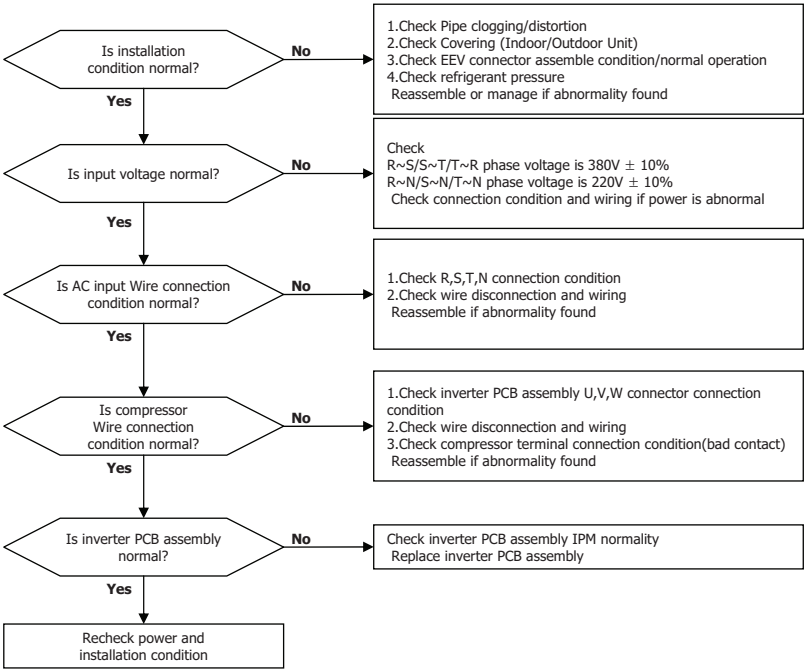


* Measuring input voltage

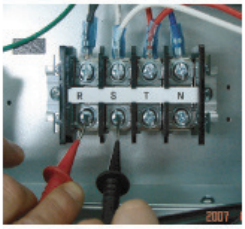


Error code	Error Contents	Meaning	Main Causes
Plus II: 731,732,733,734	AC input instant over current error (Matter of software)	Inverter PCB input 3 phase power current is over 50A(peak) for 2ms	1.Overload operation (Pipe clogging/ Covering/EEV defect/Ref. overcharge) 2.Compressor damage(Insulation damage/Motor damage) 3.Input voltage abnormal(R,S,T,N) 4.Power line assemble condition abnormal 5.Inverter PCB assembly damage(input current sensing part)

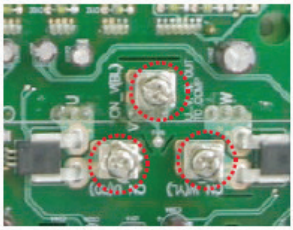
Error diagnosis and countermeasure flow chart



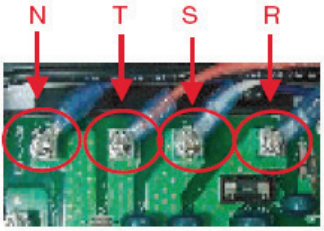
Measuring input voltage



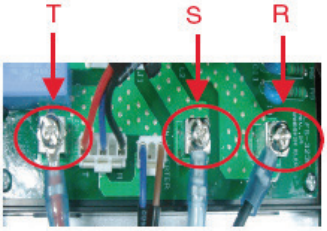
Compressor Wire Connection



Noise filter wiring

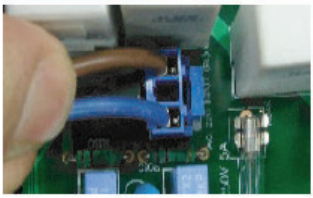


Noise filter input (upper part)



Noise filter output(lower part)

Inverter PCB assembly/Wiring power to inverter PCB on Noise filter

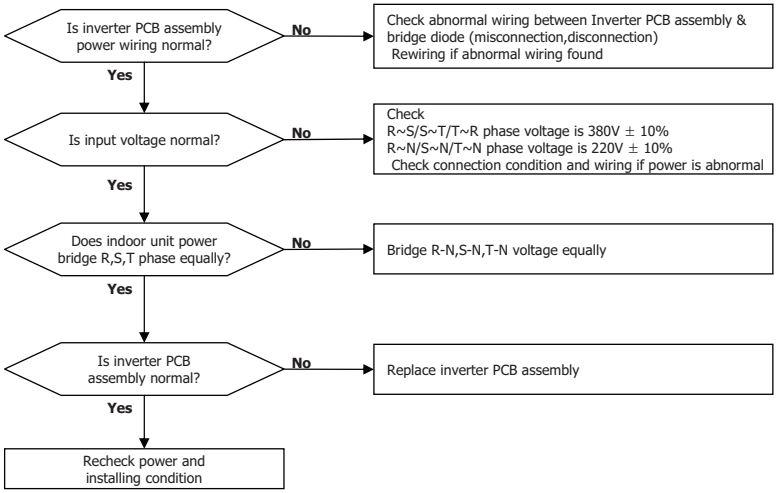


Inverter PCB assembly power connection

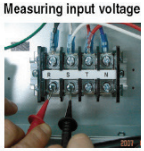
Noise filter power connection

Error code	Error Contents	Meaning	Main Causes
Plus II: 741,742,743,744	3 Phase Power Unbalance	During operation(compressor frequency is over 50Hz), difference between R & T phase is 5A for 10 seconds.	1. CT sensor defect 2. Capacity over of AVR 3. Bridge R-N or S-N or T-N phase voltage unequally at indoor unit etc.

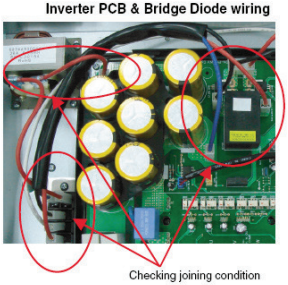
Error diagnosis and countermeasure flow chart


Is inverter PCB assembly power wiring normal?
No
Check abnormal wiring between Inverter PCB assembly & bridge diode (misconnection,disconnection)
Rewiring if abnormal wiring found
Yes
Is input voltage normal?
No
Check
R~S/S~T/T~R phase voltage is 380V ± 10%
R~N/S~N/T~N phase voltage is 220V ± 10%
Check connection condition and wiring if power is abnormal
Yes
Does indoor unit power bridge R,S,T phase equally?
No
Bridge R-N,S-N,T-N voltage equally
Yes
Is inverter PCB assembly normal?
No
Replace inverter PCB assembly
Yes
Recheck power and installing condition

Measuring input voltage



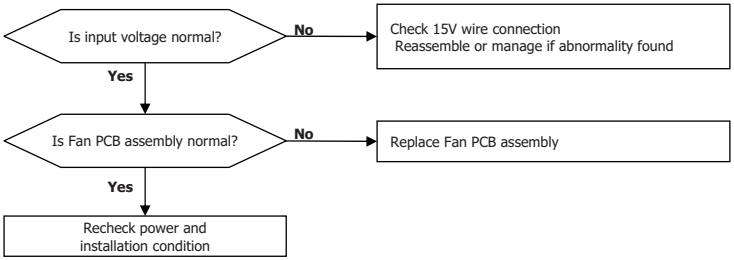
Inverter PCB & Bridge Diode wiring



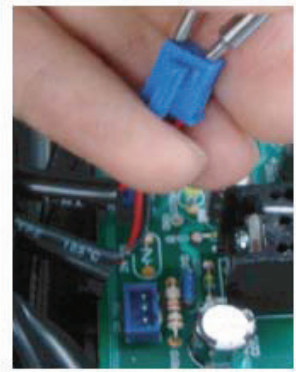
Checking joining condition

Error code	Error Contents	Meaning	Main Causes
Plus II: 751.752,753,7544	Fan CT sensor error	Offset of micom which senses the fan motor phase current is not 2.5V	1.Input voltage is abnormal(not 15V) 2.Fan PCB assembly defect

Error diagnosis and countermeasure flow chart

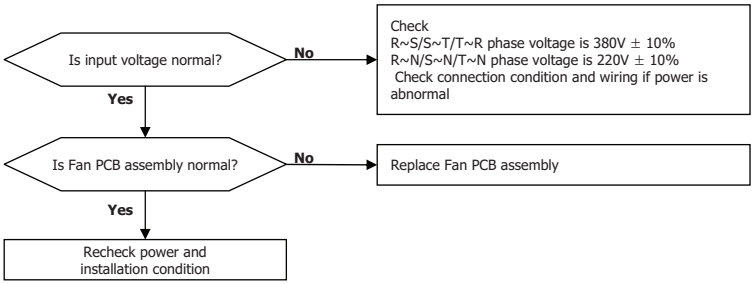


Checking 15V

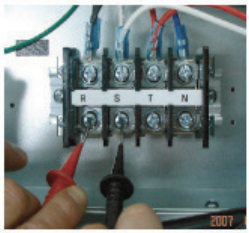


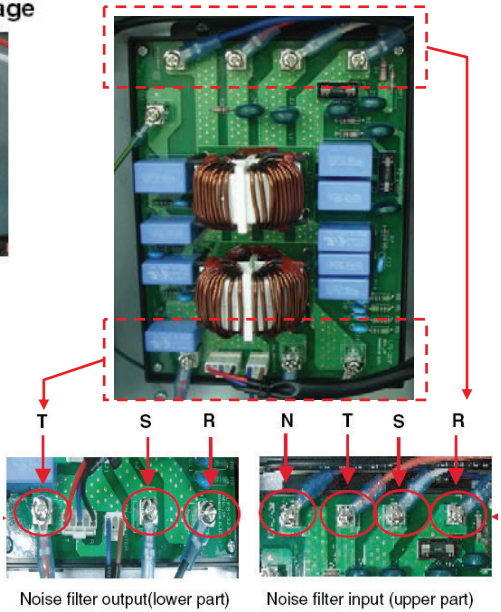
Error code	Error Contents	Meaning	Main Causes
Plus II: 761,762,763,764	Fan DC Link High Voltage Error	Fan PCB DC link voltage supplied over 780V₩	1.Input power abnormal 2.Fan PCB assembly defect

Error diagnosis and countermeasure flow chart



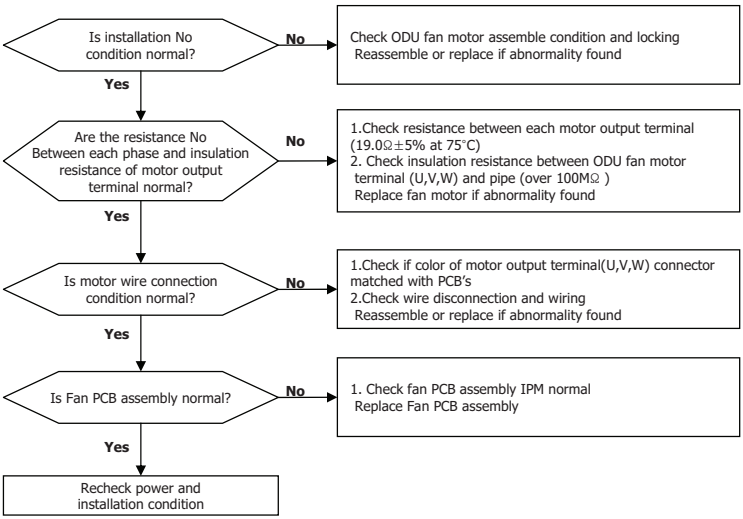
Measuring input voltage



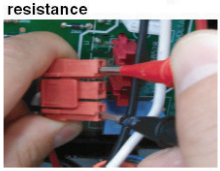


Error code	Error Contents	Meaning	Main Causes
Plus II: 771,72,773,774	Fan Over Current Error	Output current is over 5A for 40ms	1.Overload operation 2.Fan Motor defect 3.Fan PCB assembly defect

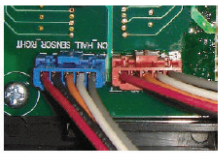
Error diagnosis and countermeasure flow chart


Is installation No condition normal?
No
Check ODU fan motor assemble condition and locking
Reassemble or replace if abnormality found
Yes
Are the resistance No Between each phase and insulation resistance of motor output terminal normal?
No
1.Check resistance between each motor output terminal (19.0Ω±5% at 75˚C)
2. Check insulation resistance between ODU fan motor terminal (U,V,W) and pipe (over 100MΩ)
Replace fan motor if abnormality found
Yes
Is motor wire connection condition normal?
No
1.Check if color of motor output terminal(U,V,W) connector matched with PCB's
2.Check wire disconnection and wiring
Reassemble or replace if abnormality found
Yes
Is Fan PCB assembly normal?
No
1. Check fan PCB assembly IPM normal
Replace Fan PCB assembly
Yes
Recheck power and installation condition

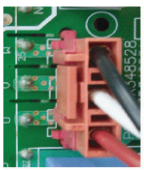
Measuring fan motor phase resistance



Hall Sensor connection

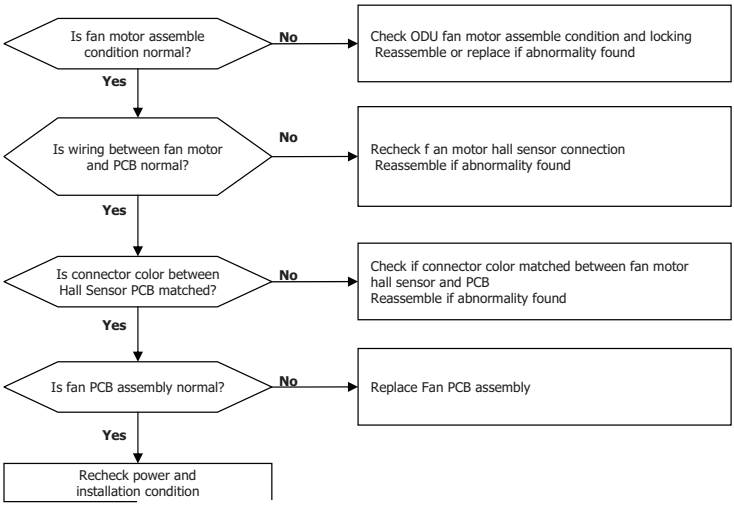


Fan motor wire connection

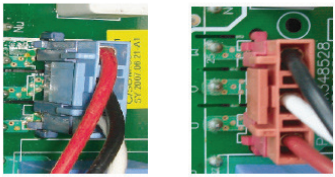


Error code	Error Contents	Meaning	Main Causes
Plus II: 781,782,783,784	Fan Motor Hall Sensor Error	Fan Motor Hall Sensor short/open	1.Fan motor hall sensor defect 2.ODU fan motor hall sensor disconnection 3.ODU Fan Motor Hall Sensor wrong insertion 4.Fan PCB assembly defect

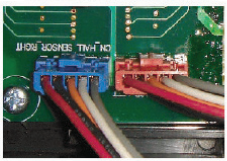
Error diagnosis and countermeasure flow chart


Is fan motor assemble condition normal?
No
Check ODU fan motor assemble condition and locking
Reassemble or replace if abnormality found
Yes
Is wiring between fan motor and PCB normal?
No
Recheck f an motor hall sensor connection
Reassemble if abnormality found
Yes
Is connector color between Hall Sensor PCB matched?
No
Check if connector color matched between fan motor hall sensor and PCB
Reassemble if abnormality found
Yes
Is fan PCB assembly normal?
No
Replace Fan PCB assembly
Yes
Recheck power and installation condition

Fan motor wire connection



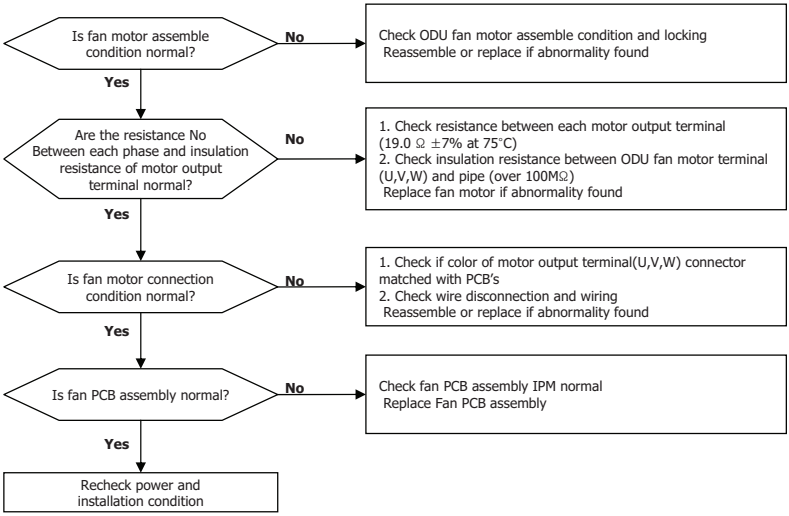
Hall sensor connection



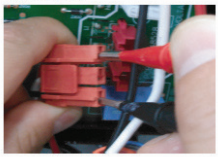
※ Note : If LED is blinking oppositely after connecting Hall Sensor connector, U.V.W output terminal oppositely, replace the motor.
If LED is not blinking oppositely,replace fan PCB assembly.

Error code	Error Contents	Meaning	Main Causes
Plus II: 791,792,793,794	Fan Starting Failure Error	Fan Motor initial starting failure	1.Fan motor defect/ assemble condition abnormal 2.Fan motor connector misconnection(Hall sensor, U,V,W ouput) 3.Fan PCB defect

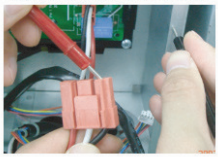
Error diagnosis and countermeasure flow chart


Is fan motor assemble condition normal?
No
Check ODU fan motor assemble condition and locking
Reassemble or replace if abnormality found
Yes
Are the resistance No Between each phase and insulation resistance of motor output terminal normal?
No
1. Check resistance between each motor output terminal (19.0 Ω ±7% at 75˚C)
2. Check insulation resistance between ODU fan motor terminal (U,V,W) and pipe (over 100MΩ)
Replace fan motor if abnormality found
Yes
Is fan motor connection condition normal?
No
1. Check if color of motor output terminal(U,V,W) connector matched with PCB's
2. Check wire disconnection and wiring
Reassemble or replace if abnormality found
Yes
Is fan PCB assembly normal?
No
Check fan PCB assembly IPM normal
Replace Fan PCB assembly
Yes
Recheck power and installation condition

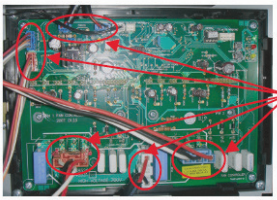
Measuring fan motor phase resistance



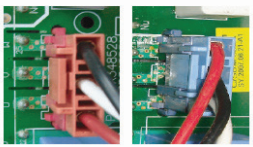
Measuring insulation resistance between fan terminal & chassis



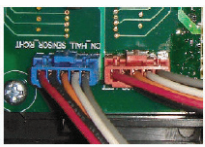
Fan wire wiring



Fan motor wire connection

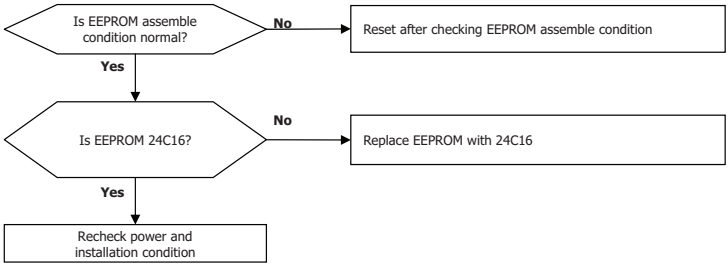


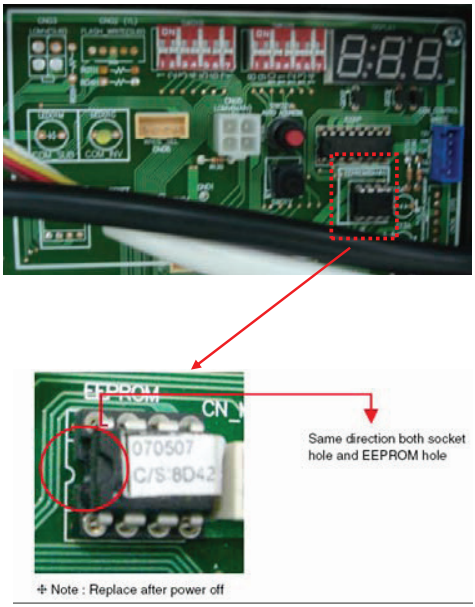
Hall Sensor connection



Error code	Error Contents	Meaning	Main Causes
Plus II: 861,862,863,864	Main PCB EEPROM Error	EEPROM Access Error	1. No EEPROM 2. EEPROM wrong insertion

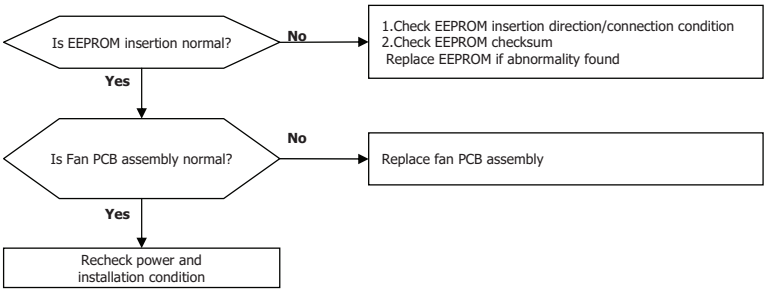
Error diagnosis and countermeasure flow chart



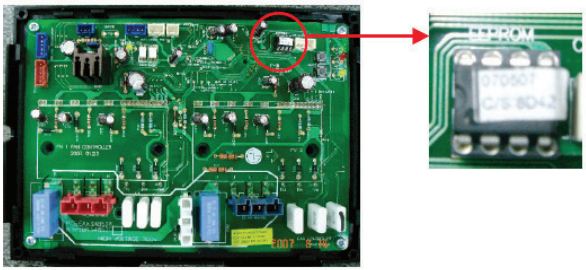


Error code	Error Contents	Meaning	Main Causes
Plus II: 871,872,873,874	Fan PCB EEPROM Error	Error occurs when checking the EEPROM checksum as initializing after power is supplied	1.EEPROM bad contact/wrong insertion 2.EEPROM Version is different 3.ODU fan PCB assembly damage

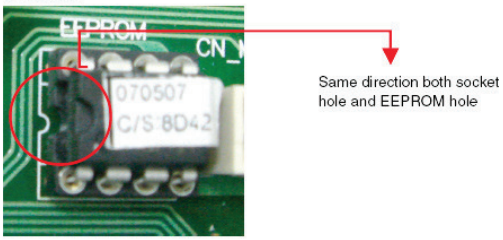
Error diagnosis and countermeasure flow chart



Fan EEPROM insertion



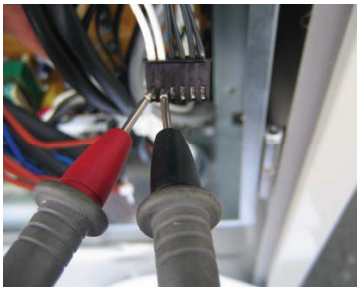
Inverter EEPROM insertion direction



※ Note : Replace after power off

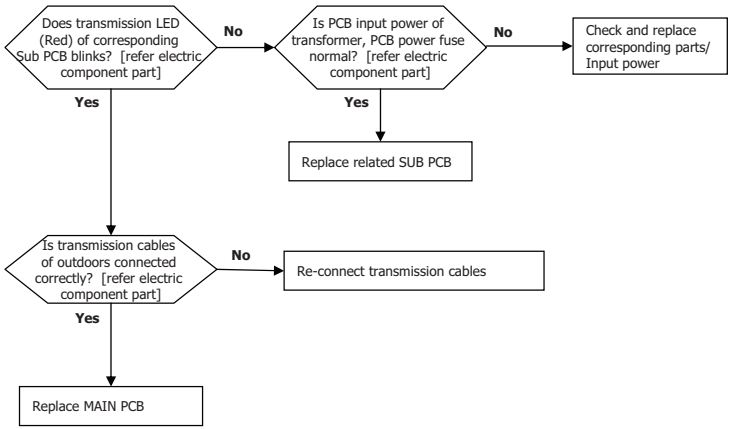
Error code	Error Contents	Meaning	Main Causes
plus: 100,101 (Sub1) 102,103 (Sub2) 152,153 (Sub3)	Over-increase of constant compressor discharge temperature of Sub outdoor	Compressor is off because of Over-increase of constant compressor discharge temperature of Sub outdoor unit	Refer to CH33

* Discharge temperature sensor of constant compressor in the sub unit

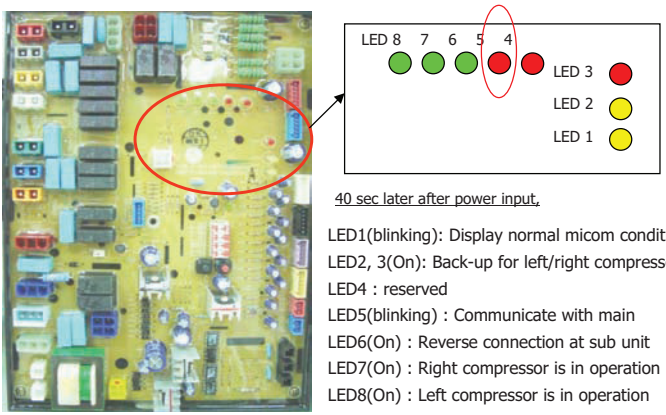


Error code	Error Contents	Meaning	Main Causes
Plus: 104 (Main) 111 (Sub1) 142 (Sub2) 156 (Sub3) Plus II: 011→041 011→042 011→043 011→044	Transmission Error Between Outdoors	Master displays ODU number which is not communicated. Slave displays own error number	1. Loose connection of power cables /transmission cables (Open/Short) 2. Each outdoor unit PCB defect 3. Defect of PCB power

Error diagnosis and countermeasure flow chart(Plus)


Does transmission LED (Red) of corresponding Sub PCB blinks? [refer electric component part]
No
Is PCB input power of transformer, PCB power fuse normal? [refer electric component part]
No
Check and replace corresponding parts/ Input power
Yes
Yes
Replace related SUB PCB
Is transmission cables of outdoors connected correctly? [refer electric component part]
No
Re-connect transmission cables
Yes
Replace MAIN PCB

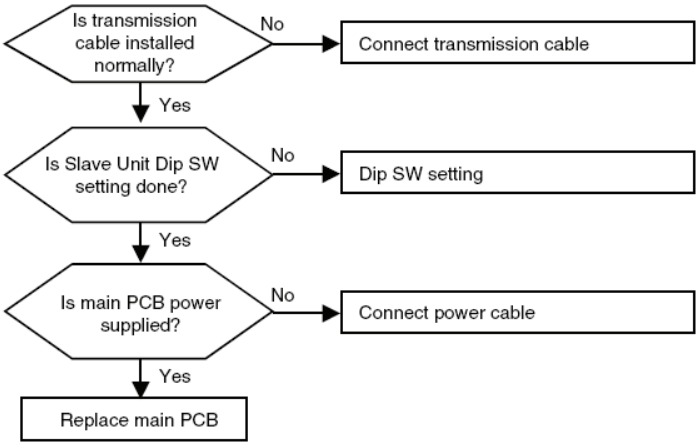
Sub unit PCB



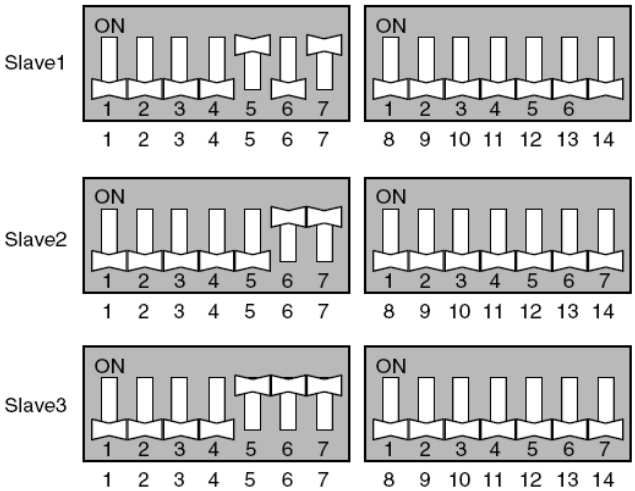
40 sec later after power input,

LED1(blinking): Display normal micom condition
LED2, 3(On): Back-up for left/right compressor
LED4 : reserved
LED5(blinking) : Communicate with main
LED6(On) : Reverse connection at sub unit
LED7(On) : Right compressor is in operation
LED8(On) : Left compressor is in operation

Error diagnosis and countermeasure flow chart(Plus II)

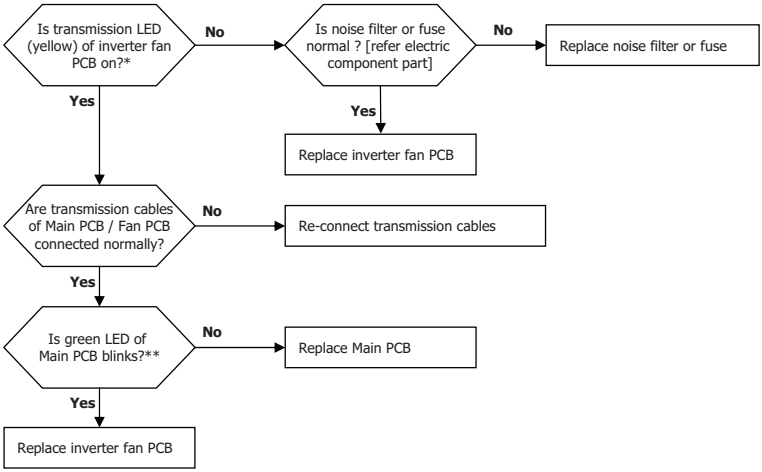


*** Slave Unit Dip SW**

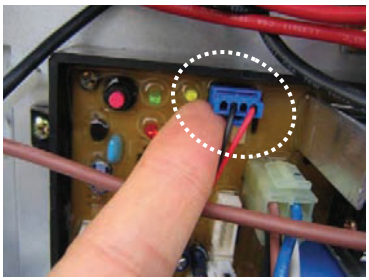


Error code	Error Contents	Meaning	Main Causes
Plus:105 Plus II: 11→051 11→52 11→53 11→54	Plus:Transmission error between outdoor unit Main PCB and fan Main PCB Plus II:Transmission error between outdoor unit Inv PCB and fan PCB	Plus:Transmission error between outdoor Main PCB and fan Main PCB (Fan → outdoor main) Plus:Transmission error between outdoor Inv PCB and fan PCB (Fan → inv)	-Plus 1. Loose connection of transmission cables 2. Transmission cables are open/sort 3. Outdoor Main PCB PCB defect 4. Fan Main PCB defect -Plus II 1. Wrong connection between Inverter and Fan PCB 2. Fan PCB power not supplied 3. ODU Inv/Fan PCB defect

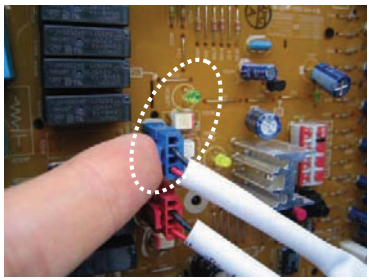
Error diagnosis and countermeasure flow chart(Plus)

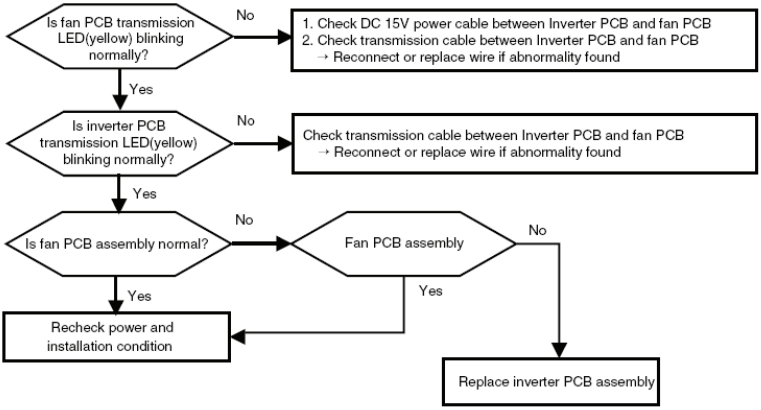


* Location of inverter transmission connector of Main PCB and LED

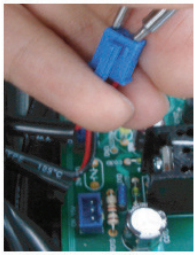


**Location of PCB transmission connector of Inverter FAN and LED

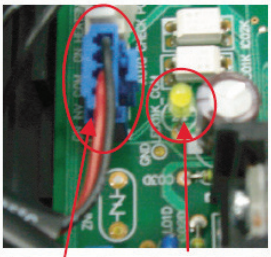



Is fan PCB transmission LED(yellow) blinking normally?
No
1. Check DC 15V power cable between Inverter PCB and fan PCB
2. Check transmission cable between Inverter PCB and fan PCB
→ Reconnect or replace wire if abnormality found
Yes
Is inverter PCB transmission LED(yellow) blinking normally?
No
Check transmission cable between Inverter PCB and fan PCB
→ Reconnect or replace wire if abnormality found
Yes
Is fan PCB assembly normal?
No
Fan PCB assembly
No
Yes
Yes
Recheck power and installation condition
Replace inverter PCB assembly

Checking 15V input

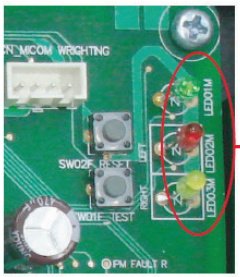


Fan transmission connection



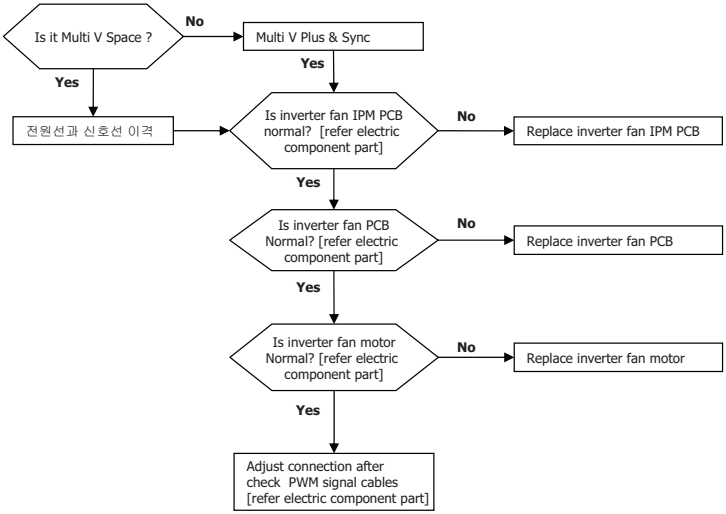
※ Note : Check fan PCB assembly Error LED blinking (Check 108π Error)

Fan Error LED



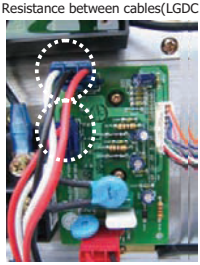
Error code			Error Contents	Meaning	Main Causes
Plus:106 Plus II: 11→061 12→062 13→063 14→064			Over current of Main outdoor fan motor (inverter fan IPM fault)	IPM protection circuit activation (over current / overheating)	1. Overload operation (Pipe clogging/Covering/EEV defect/Ref. overcharge 2. ODU fan motor assemble condition abnormal (Coil disconnection/Short/Insulation damage) 3. Fan PCB heatsink assemble condition abnormal 4. Fan PCB assembly defect
SPACE	N1 106	Right Fan			
	N2 106	Left Fan			

Error diagnosis and countermeasure flow chart(Plus)



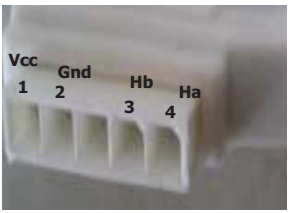
* check fan motor

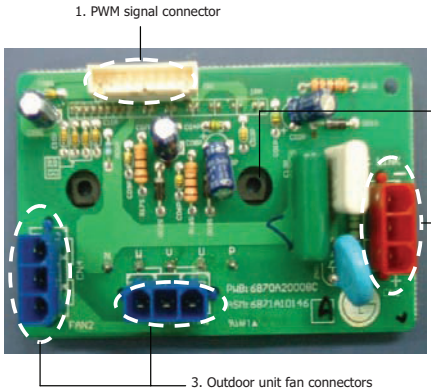
- [Multi V Plus & Sync]Check Inv the resistance on fan motor connectors
- Resistance between cables : 18 ±3Ω
- Resistance between cables(LGDC fan) : 19 ±7% (75℃)

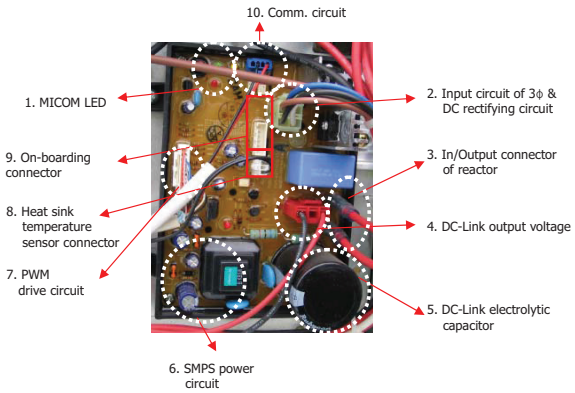


- [Multi V Space] Check hall sensor of BLDC fan motor

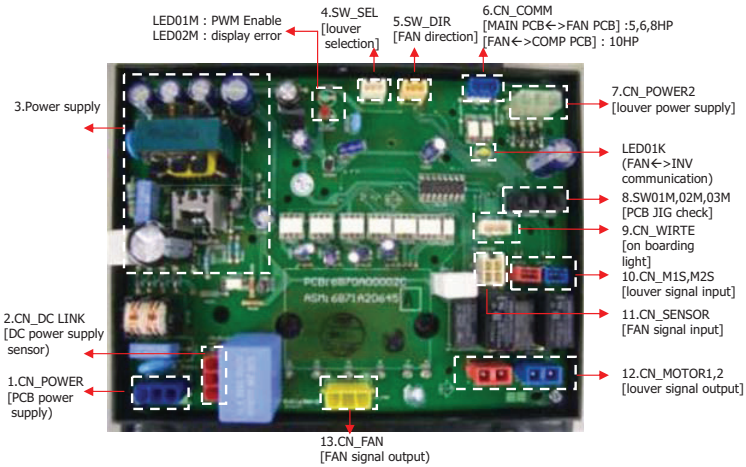
Ha(4),Hb(3) ←-→ Gnd(2) : 24 MΩ
Ha(4),Hb(3) ←-→ Vcc(1) : 11 kΩ



Part (Function)	Check points	How to check?	Counter-measure
Inverter fan IPM PCB			
	1.PWM signal 2.Fan DC power 3.Outdoor fan connector 4. IPM	-Check 9pin connectors - DC voltage should be charged of 310V - While Fan operating, in case voltage of - connectors(U-V,V-W,U-W) is 100~300V - → Normal -- Check Diode(P-N : 0.95V, - P-U,P-V,P-W: 0.55V - N-U,N-V,N-W: 0.55V DIODE측정(P-U : 0.5V)	-Replace cables & check soldering condition of PCB - Replace connectors & inverter PCB if not charging - Replace inverter IPM PCB

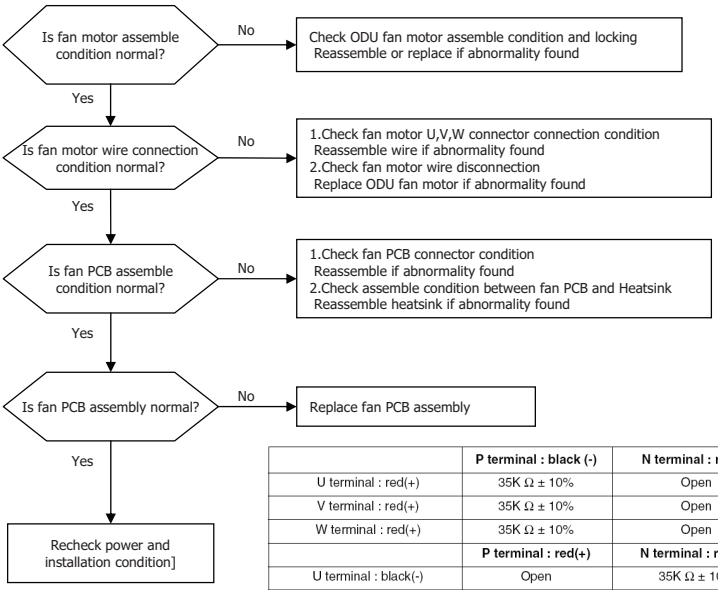
Part (Function)	Check points	How to check?	Counter-measure
No power on PCB			
	2.3φ power Input circuit	-Input voltage of 3ϕ 4 wires should be 3ϕ 380V, 1ϕ 220V - Check half wave rectifying circuit diode (R-Reactor1: 0.6V, S-Reactor1: 0.6V: T-Reactor1: 0.6V) 	-Check supply voltage, noise filter, fuse -Replace inverter fan PCB
	10. Transmission circuit with main PCB	-Yellow LED should blink.	-Check yellow LED blinks or not -When is OFF / ON continuously, check transmission with main PCB
	Red LED	-When red LED blinks, error code happens about inverter fan PCB	-Check error code at main PCB

Multi V Space BLDC FAN PCB



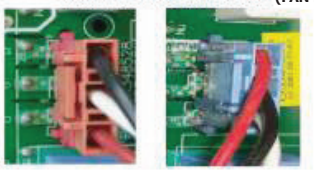
Situation	Monitoring Location	How to check?	Counter-measure
Power does not turn on	1.CN POWER 3. Power supply (CH105)	-AC voltage measure 220V - ZNR01D(barrister),FUSE burn out checkup	-Input voltage (220V) -Replace related parts
FAN motion disabled	2.CN_DC LIINK 13.CN_FAN (CH106) 11.CN_SENSOR (CH67)	-DC 470V~520V displays -DC 380V and above are normal - U,V,W electric flow measurement stabilize -Check connectors	- Check and replace CAPACITOR - Replace PCB - Check up and replace connection and motor
communication does not work	6. CN-COMM (CH105)	-Flick LED01K - check connector and PCB (power supply ,communication)	-Check PCB power supply(220V) -Check and replace connector and PCB
Louver does not work	4.SW_SEL 7.CN_POWER2 10.CN_M1S,M2S 12.CN_MOTOR1,2	Check if connector is connected -DC24V display check -Connection status check Connection status check	-connect connectors (if there are no louver) -Check and Replace trance and power supply -Check and replace louver motor and connection part Check and replace louver motor and connection part

Error diagnosis and countermeasure flow chart (Plus II)

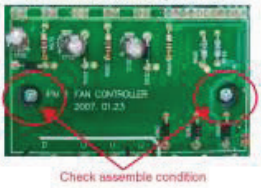

Is fan motor assemble condition normal?
No
Check ODU fan motor assemble condition and locking
Reassemble or replace if abnormality found
Yes
Is fan motor wire connection condition normal?
No
1.Check fan motor U,V,W connector connection condition
Reassemble wire if abnormality found
2.Check fan motor wire disconnection
Replace ODU fan motor if abnormality found
Yes
Is fan PCB assemble condition normal?
No
1.Check fan PCB connector condition
Reassemble if abnormality found
2.Check assemble condition between fan PCB and Heatsink
Reassemble heatsink if abnormality found
Yes
Is fan PCB assembly normal?
No
Replace fan PCB assembly
Yes
Recheck power and installation condition]

	P terminal : black (-)	N terminal : red (-)
U terminal : red(+)	35K Ω ± 10%	Open
V terminal : red(+)	35K Ω ± 10%	Open
W terminal : red(+)	35K Ω ± 10%	Open
	P terminal : red(+)	**N terminal : red (+)**
U terminal : black(-)	Open	35K Ω ± 10%
V terminal : black(-)	Open	35K Ω ± 10%
W terminal : black(-)	Open	35K Ω ± 10%

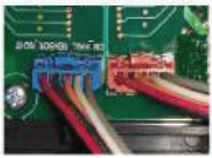
Fan Motor Wire connection (FAN PCB)



Fan IPM assemble position

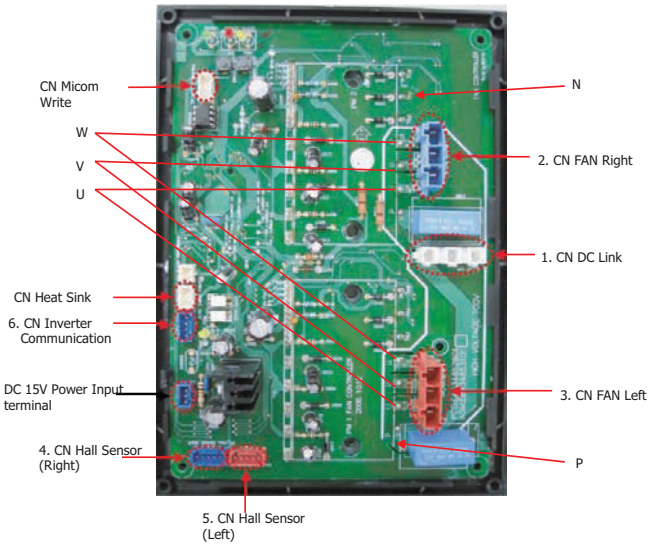


Hall Sensor connection (FAN PCB)



Fan Heatsink assemble position (FAN PCB)

Multi V Plus II LGDC FAN PCB

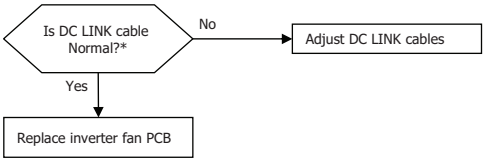


Situation	Monitoring Location	How to check?	Counter-measure
FAN motion disabled	1.CN_DC LIINK 2/3. CN_FAN (CH106) 4/5. CN_HALL SENSOR(CH67)	-DC 470V~520V displays -DC 380V and above are normal - U,V,W electric flow measurement stabilize -Check connectors	- Check DC Voltage at FAN PCB terminal (more than 380V—Normal) - Replace PCB - Check up and replace connection and motor
Communication does not work	6. CN-COM (CH105)	-Flick LED01K - Check 15V DC power input - Check Connector	- Check DC power input terminal - Check and replace connector and PCB
Fan IPM	P-N & U,V,W		

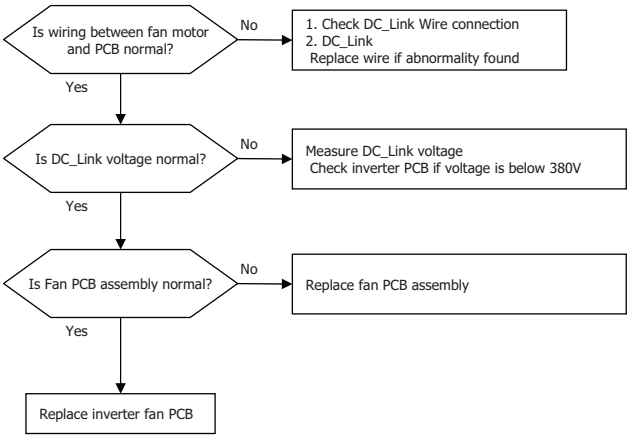
	P terminal : black (-)	N terminal : red (-)
U terminal : red(+)	35K Ω ± 10%	Open
V terminal : red(+)	35K Ω ± 10%	Open
W terminal : red(+)	35K Ω ± 10%	Open
	P terminal : red(+)	**N terminal : red (+)**
U terminal : black(-)	Open	35K Ω ± 10%
V terminal : black(-)	Open	35K Ω ± 10%
W terminal : black(-)	Open	35K Ω ± 10%

Error code			Error Contents	Meaning	Main Causes
Plus:107 Plus II: 11→071 12→072 13→073 14→074			DC voltage charging failure of inverter fan motor drive	Low voltage of Main outdoor fan motor (below 380V)	1. Bad connection of voltage lead cable of main PCB DC link 2. Fan main PCB capacitor defect 3. Fan main PCB defect
S P A C E	N1 107	Right Fan			
	N2 107	Left Fan			

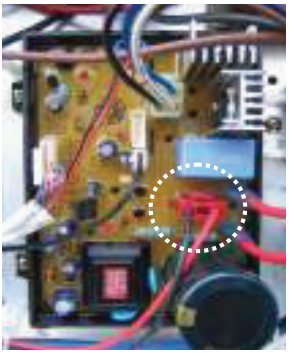
Error diagnosis and countermeasure flow chart(Plus)



Error diagnosis and countermeasure flow chart(Plus II)



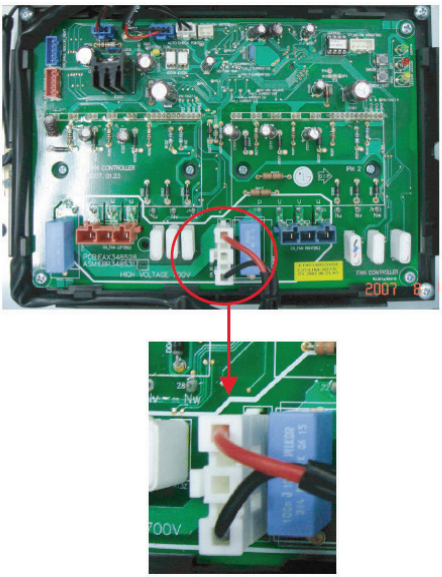
- Inverter fan main PCB



- Inverter fan IPM PCB

(Plus)

DC voltage connection



DC Volt connected
Check DC Voltage 470~520

(Plus II)

Error code	Error Contents	Meaning	Main Causes
Plus: 109 (Sub1)	Excessive rise of high pressure in outdoor unit	Compressor Off due to the high pressure switch in outdoor unit	Refer to CH24

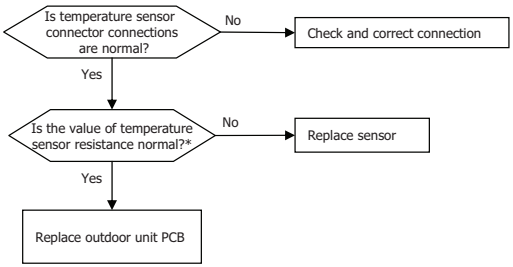
Plus: 110 (Sub1)	Outdoor 3 phase power supply problem (Reverse phase / No power in 1 or 2 phase)	Wrong connection of 3 phase power cable (Reverse phase / Phase omission)	Refer to CH54

Plus: 111 (Sub1)	Transmission error between outdoor units	104 → transmission error between the outdoor units (Main outdoor unit is not receiving signal from Sub units) 147, 149, 171 → Sub outdoor units are not receiving signal from Main outdoor unit	Refer to CH104

Error code	Error Contents	Meaning	Main Causes
Plus: 113 (Main) 125 (Sub1) 137 (Sub2) 166 (Sub3) Plus II: 11→131 12→132 13→133 14→134	Outdoor unit liquid pipe (condenser) temperature sensor error	Abnormal sensor resistance value (Open/Short)	1. Defective temperature sensor connection 2. Temperature sensor defect(Open / Short) 3. Outdoor unit main PCB defect

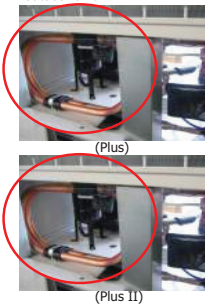
Error code	Error Contents	Meaning	Main Causes
Plus: 114 (Main sub-cool inlet) 115 (Main sub-cool outlet) 126 (Sub1 sub-cool inlet) 127 (Sub1 sub-cool outlet) 138 (Sub2 sub-cool inlet) 139 (Sub2 sub-cool outlet) 167 Sub3 sub-cool inlet) 168 (Sub3 sub-cool outlet) Plus II: 11→141(sub-cool inlet) 12→142 13→143 14→144, 11→151(sub-cool outlet) 11→152 11→153 11→154	Outdoor unit sub-cooling inlet / outlet temperature sensor error	Abnormal sensor resistance value (Open/Short)	1. Defective temperature sensor connecter connection 2. Temperature sensor defect(Open / Short) 3. Outdoor unit main PCB defect

Error diagnosis and countermeasure flow chart



* Sensor resistance 100 kΩ over (open) or 100 Ω below (short) will generate error

• Sub-cool circuit in the outdoor unit



(Plus)

(Plus II)

Note: Temperate sensor resistance vary with temperature, So compare temperature sensor resistance value according to outdoor unit temperature by referring below table (±5% tolerance)
Air temperature sensor: 10℃ = 20.7kΩ : 25℃= 10kΩ : 50℃= 3.4kΩ
Pipe temperature sensor: 10℃ = 10kΩ : 25℃= 5kΩ : 50℃= 1.8kΩ

- Liquid pipe temp sensor

- Sub-cool inlet temp sensor

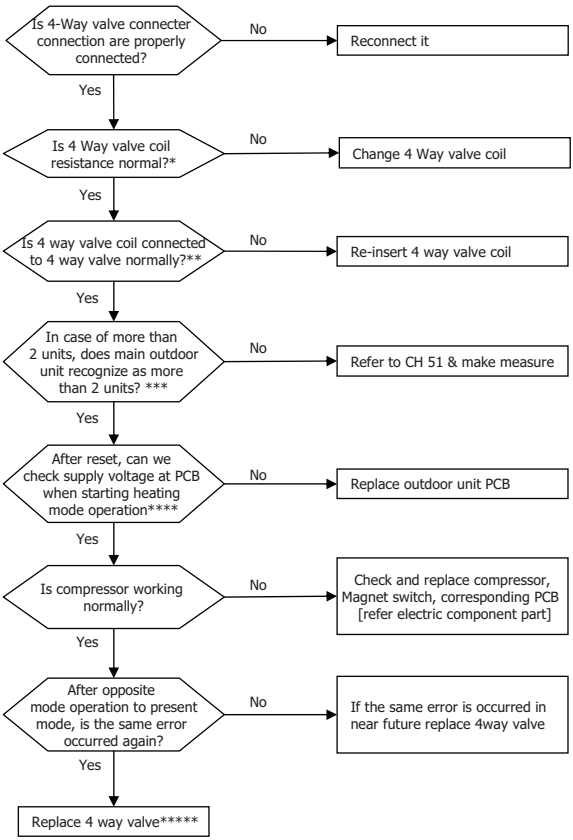
- Sub-cool outlet temp sensor

Error code	Error Contents	Meaning	Main Causes
116 (Plus Sub1)	High pressure sensor	Sensor measured value of resistance is abnormal (Open / Short)	Refer CH43
117 (Plus Sub1)	Low pressure sensor	Sensor measured value of resistance is abnormal (Open/Short)	Refer to CH42
118 (Plus Sub1)	Outdoor unit air temperature sensor error	Sensor measured value of resistance is abnormal (Open / Short)	Refer to CH44
120 (Plus Sub1)	Compressor suction pipe temperature sensor error	Sensor measured of resistance value is abnormal (Open/Short)	Refer to CH46
121 (Plus Sub1 constant compressor 1) 122 (Plus Sub1 constant compressor 2)	Compressor discharge pipe temperature sensor error	Sensor measured value of resistance is abnormal (Open/Short)	Refer to CH41
123 (Plus Sub1 HEX A) 124 (Plus Sub1 HEX B)	Sub outdoor unit heat exchanger (A,B) pipe sensor error.	Sensor measured value of resistance is abnormal (Open/Short)	Refer to CH45
125 (Plus Sub1)	Outdoor liquid pipe (condenser) sensor error	Sensor measured value of resistance is abnormal (Open/Short)	Refer to CH113
126 (Plus Sub1 Sub-cool inlet) 127(Plus Sub1 Sub-cool outlet)	Outdoor unit sub-cool inlet / outlet sensor error	Sensor measured value of resistance is abnormal (Open/Short)	Refer to CH114
128 (Plus Sub2)	High pressure sensor error	Sensor measured value is abnormal (Open/Short)	Refer to CH43
129 (Plus Sub2)	Low pressure sensor error	Sensor measured value is abnormal (Open/Short)	Refer to CH42
130 (Plus Sub2)	Outdoor unit air temperature sensor error	Sensor measured value is abnormal (Open/Short)	Refer to CH44
132 (Plus Sub2)	Compressor suction temperature sensor error	Sensor measured value is abnormal (Open/Short)	Refer to CH46
133 (Plus Sub2 Const compressor1) 134 (Plus Sub2 Const compressor2)	Compressor discharge pipe temperature sensor error	Sensor measured value is abnormal (Open/Short)	Refer to CH41
135 (Plus Sub2 HEX A) 136 (Plus Sub2 HEX B)	Sub Outdoor unit heat exchanger (A,B) pipe temperature sensor error	Sensor measured value is abnormal (Open/Short)	Refer to CH45

Error Code	Error Contents	Meaning	Main Causes
140 (Plus Sub2)	Excessive rise in outdoor high pressure	Compressor Off due to the high pressure switch in outdoor unit	Refer to CH24
141 (Plus Sub2)	Outdoor 3 phase power supply problem (Reverse phase / phase omission)	Wrong wiring at outdoor unit (phase reversal / phase omission)	Refer to CH54
142 (Plus Sub2)	Transmission error between outdoor units	Transmission error between outdoor units 104 (Main outdoor unit is not receiving sub outdoor unit s signals) 147, 149, 171 (Sub outdoor units are not receiving main unit signals)	Refer to CH104
143 (Plus Sub1) 145 (Plus Sub2)	Excessive rise in high pressure	Compressor Off due to high pressure sensor	Refer to CH34
144 (Plus Sub1) 146 (Plus Sub2)	Excessive drop in low pressure	Compressor Off due to low pressure sensor	Refer to CH35
147 (Plus Sub1) 149 (Plus Sub2)	Low voltage/ High voltage	1. Input Voltage in the installation region = 3phase 380V±10% 2. Single Phase = 220 ±10%	Refer to CH25
148 (Plus Sub1) 150 (Plus Sub2)	Outdoor voltage sensing error	Measured value is abnormal (Open/Short)	Refer to CH49

Error Code	Error Contents	Meaning	Main Causes
Plus: 151 Plus II: 11→511 11→512 11→513 11→514	Function error of outdoor 4way (reversing valve)	Function error of 4way (reversing valve) in Main or Sub outdoor units	1. Wrong operation of 4way valve because of sludge etc. inflow 2. No pressure difference because of compressor fault 3. Wrong installation of In/outdoor common pipe 4. 4way valve defect

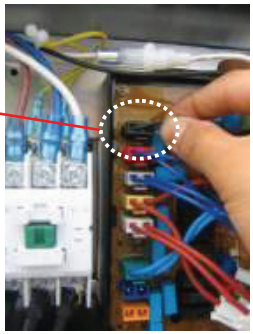
Error diagnosis and countermeasure flow chart


Is 4-Way valve connecter connection are properly connected?
No
Reconnect it
Yes
Is 4 Way valve coil resistance normal?*
No
Change 4 Way valve coil
Yes
Is 4 way valve coil connected to 4 way valve normally?**
No
Re-insert 4 way valve coil
Yes
In case of more than 2 units, does main outdoor unit recognize as more than 2 units? ***
No
Refer to CH 51 & make measure
Yes
After reset, can we check supply voltage at PCB when starting heating mode operation****
No
Replace outdoor unit PCB
Yes
Is compressor working normally?
No
Check and replace compressor, Magnet switch, corresponding PCB [refer electric component part]
Yes
After opposite mode operation to present mode, is the same error occurred again?
No
If the same error is occurred in near future replace 4way valve
Yes
Replace 4 way valve*****

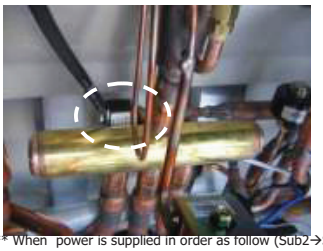
(Plus)

* Measure the resistance of 4way valve

* Location of 4way valve connector on Main / Sub PCB (marked as 4way)



** Confirm the 4way valve coil is inserted to the end



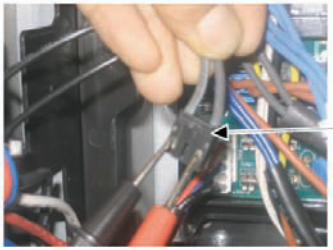
*** When power is supplied in order as follow (Sub2→Sub1→Main)
3rd number indicates outdoor quantity at Main PCB 7-segment LED
- Outdoor unit 1set : Model code-capacity(or 10)-..
- Outdoor unit 2set : Model code(Main)-Model code(sub)-capacity(or 20)-..
- Outdoor unit 3set : Model code(Main)-Model code(sub1)- Model code(sub2)- capacity(or 30)- ..

**** Check the output voltage of terminal socket during heating operation : 220V (±10%)

***** Checking method for outdoor unit of 3unit system
① Close all the SVC valves of high / low pressure common pipe
② Operate system
③ Check the difference of high and low pressure with LGMV for each unit (Main, Sub1, Sub2)
④ If there is a unit in which the difference is not increased then the 4way valve of that unit is defective

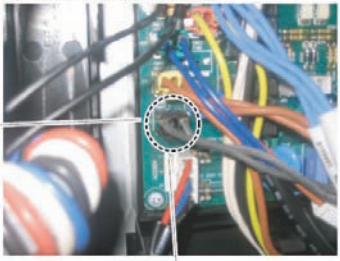
(Plus II)

* Measure the resistance of 4way valve

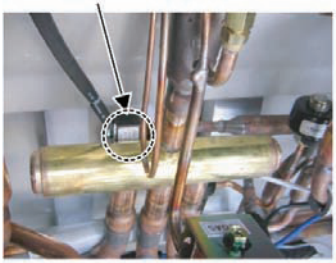


Main PCB

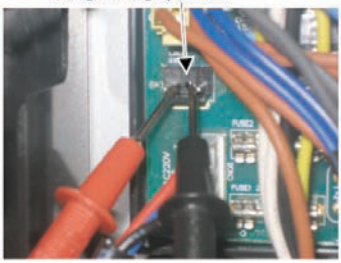
Location of 4way valve connector on Main PCB(marked as 4way,CN09)



** Confirm the 4way valve coil is inserted to the end



**** Check the output voltage of terminal sock during heating operation



*** When power is supplied in order as follow
(Slave2 → Slave1 → Mater)
ODU information is displayed one after the other at main PCB 7-segment

1. Model ID
   → 5HP:60 , 6HP:61 , 8HP:62 , 10HP:63, 12HP:64, 14HP:65
2. Total Capacity
   → Displayed with HP
3. ODU Type
   → HEAT PUMP : 2, Cooling : 0
4. Normal mode : 25
5. Refrigerant
   → R410a : 41

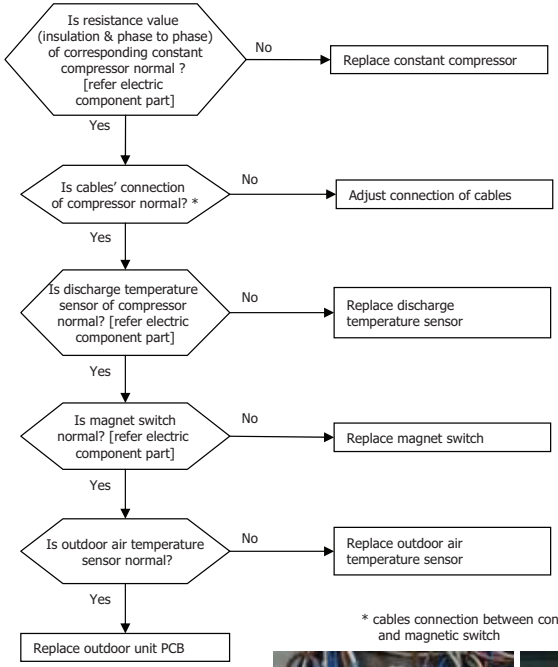
***** Checking method for outdoor unit of 3unit system
(Master + Slave1 + Slave2)

① Close all the SVC valves of high / low pressure common pipe
② Operate system
③ Check the difference of high and low pressure with LGMV for each unit (Master, Slave1, Slave2)
④ If there is a unit in which the difference is not increased then the 4way valve of that unit is defective

Error Code	Error Contents	Meaning	Main Causes
152,153 (Plus Sub3)	Excessive rise of the constant compressor discharge temperature	Constant speed compressor Off due to the excessive rise in discharge temp	Refer to CH33
155 (Plus Sub3)	Outdoor 3 phase power supply wiring wrong (Reverse phase / Phase omission)	Wrong wiring at the outdoor 3 phase (Reverse phase / Phase omission)	Refer to CH54
156 (Plus Sub3)	transmission error between outdoor units	transmission error between outdoor units 104 (Main outdoor unit is not receiving sub outdoor unit s signals) 147, 149, 171 (Sub outdoor units are not receiving main unit signals)	Refer to CH104
157 (Plus Sub3)	High pressure sensor error	Abnormal resistance value of sensor measurement (Open / Short)	Refer to CH43
158 (Plus Sub3)	Low pressure sensor error	Abnormal resistance value of sensor measurement (Open / Short)	Refer to CH42
159 (Plus Sub3)	Outdoor unit air temperature sensor error	Abnormal resistance value of sensor measurement (Open / Short)	Refer to CH44
161(Plus Sub3)	Compressor suction temperature error	Abnormal resistance value of sensor measurement (Open / Short)	Refer to CH46
162 (Plus Sub3 constant compressor1) 163 (Plus Sub3 constant ompressor2)	Compressor discharge pipe temperature sensor error	Abnormal resistance value of sensor measurement (Open / Short)	Refer to CH41
164 (Plus Sub3 HEX A) 165 (Plus Sub3 HEX B)	Pipe sensor error of the main and sub units heat exchanger (A,B)	Abnormal resistance value of sensor measurement (Open / Short)	Refer to CH45
166(Plus Sub3)	Sensor error at the outdoor liquid refrigerant pipe	Abnormal resistance value of sensor measurement (Open / Short)	Refer CH113
167 (Plus Sub3 sub-cooling inlet) 168 (Plus Sub3 sub-cooling outlet)	Outdoor unit sub-cooling sensor error at inlet / outlet	Abnormal resistance value of sensor measurement (Open / Short)	Refer to CH114
169(Plus Sub3)	Excessive rise in high pressure	Compressor Off due to the high pressure sensor	Refer to CH34
170(Plus Sub3)	Excessive low pressure drop	Compressor Off due to the low pressure sensor	Refer to CH35
171(Plus Sub3)	Excessive Low voltage / High voltage	1.Input voltage in the installation region = 3phase 380V±10% 2. Single phase = 220V ±10%	Refer to CH25
172(Plus Sub3)	Outdoor voltage sensing error	Abnormal resistance value of sensor measurement (Open / Short)	Refer to CH49

Error Code	Error Contents	Meaning	Main Causes
Plus: 173 (MAIN constant) 174, 175 (sub1 constant 1,2) 176, 177 (sub2 constant 1,2) Plus II: 11→731 11→732 11→733 11→734	Abnormal staring of constant compressor	Over-increase of temperature after constant compressor starts	1. Constant compressor defect 2. Discharge temperature sensor defect 3. Outdoor temperature sensor defect 4. Outdoor main PCB defect 5. Magnet switch defect 6. Wrong connection of constant compressor cables

Error diagnosis and countermeasure flow chart


Is resistance value (insulation & phase to phase) of corresponding constant compressor normal ? [refer electric component part]
No
Replace constant compressor
Yes
Is cables' connection of compressor normal? *
No
Adjust connection of cables
Yes
Is discharge temperature sensor of compressor normal? [refer electric component part]
No
Replace discharge temperature sensor
Yes
Is magnet switch normal? [refer electric component part]
No
Replace magnet switch
Yes
Is outdoor air temperature sensor normal?
No
Replace outdoor air temperature sensor
Yes
Replace outdoor unit PCB

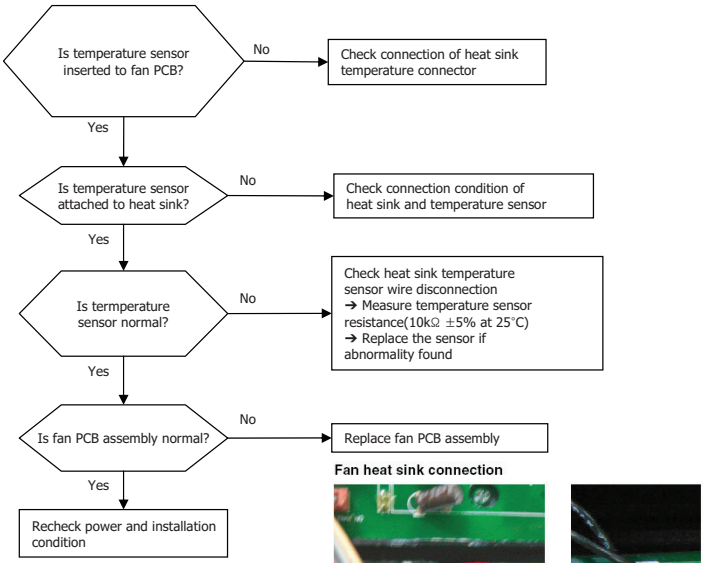
* cables connection between constant compressor and magnetic switch

(Puls)

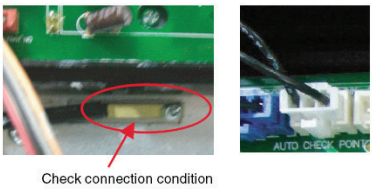
(Puls II)

Error Code	Error Contents	Meaning	Main Causes
Plus II: 11→931 11→932 11→933 11→934	Fan PCB heatsink temperature high	Heat sink temperature is over 95˚C	1. Heatsink temperature sensor defect 2. Fan PCB assembly defect
Plus II: 11→941 11→942 11→943 11→944	Fan PCB heatsink temperature sensor error	Heatsink Temperature Sensor Abnormal	1. Heatsink temperature sensor defect(Open/Short) 2. Wrong connection of temperature sensor connector 3. Fan PCB assembly defect

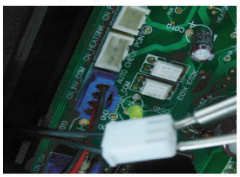
Error diagnosis and countermeasure flow chart


Is temperature sensor inserted to fan PCB?
No
Check connection of heat sink temperature connector
Yes
Is temperature sensor attached to heat sink?
No
Check connection condition of heat sink and temperature sensor
Yes
Is termperature sensor normal?
No
Check heat sink temperature sensor wire disconnection
→ Measure temperature sensor resistance(10kΩ ±5% at 25˚C)
→ Replace the sensor if abnormality found
Yes
Is fan PCB assembly normal?
No
Replace fan PCB assembly
Yes
Recheck power and installation condition

Fan heat sink connection

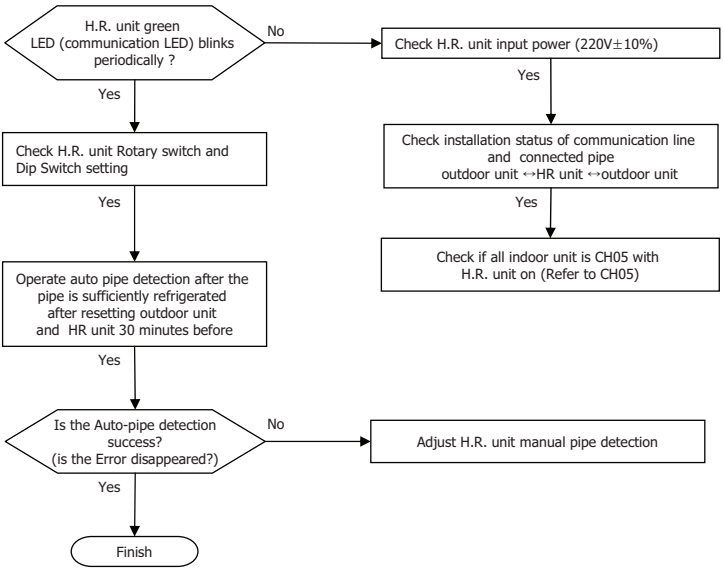


Checking temperature sensor disconnection



Error Code	Error Contents	Meaning	Main Causes
200	Pipe detection error	After the Auto operation, if the number of the indoor units detected is different from the number communicating indoor unit	1. HR unit's power cable or transmission cable connection defect 2. After Auto-Addressing, wrong address setting of the indoor unit (Defective indoor power / transmission error and PCB defect) 3. Wrong setting of the HR unit's rotary switch or dip switch 4. HR unit PCB defect
H1 01…H1 04 H2 01…H2 04 H3 01…H3 04 H4 01…H4 04 . . .	Pipe detection error	failed to search pipe connected to HR unit valve of marked number (Ex : H1 02 →no.2 valve pipe of no.1 HR unit failed to search)	1. HR unit's power cable or transmission cable connection defect 2. After Auto-Addressing, wrong address setting of the indoor unit (Defective indoor power / transmission error and PCB defect) 3. Wrong setting of the HR unit's rotary switch or dip switch 4. HR unit PCB defect

Error diagnosis and countermeasure flow chart


H.R. unit green LED (communication LED) blinks periodically ?
No
Check H.R. unit input power (220V±10%)
Yes
Yes
Check H.R. unit Rotary switch and Dip Switch setting
Check installation status of communication line and connected pipe outdoor unit ↔HR unit ↔outdoor unit
Yes
Yes
Check if all indoor unit is CH05 with H.R. unit on (Refer to CH05)
Operate auto pipe detection after the pipe is sufficiently refrigerated after resetting outdoor unit and HR unit 30 minutes before
Yes
Is the Auto-pipe detection success? (is the Error disappeared?)
No
Adjust H.R. unit manual pipe detection
Yes
Finish

[NB] If Indoor units/transmission cables of HR unit and cables of power 220V has been changed each other, transmission parts and indoor will be burnt

▶ Auto addressing

Turn on "HR unit → Indoor unit → Outdoor unit" in the order named

Wait for 3 minute

Press SW02M of the ODU main PCB for 5 seconds

'88' is displayed on the ODU main PCB and the HRU PCB

After 2~7 minute, the number of IDU connected is displayed at 7-seg of the ODU main PCB

The number of HRU connected is displayed at 7-seg of the ODU main PCB

Equal number of "IDU and displayed one"? in terms of "wiring"

No

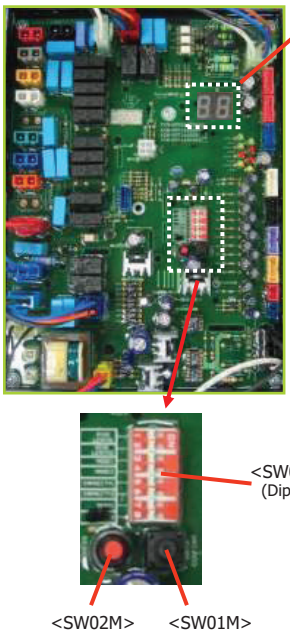
Check power and communication wiring between ODU, HRU, IDU

Retry auto addressing after solving problem

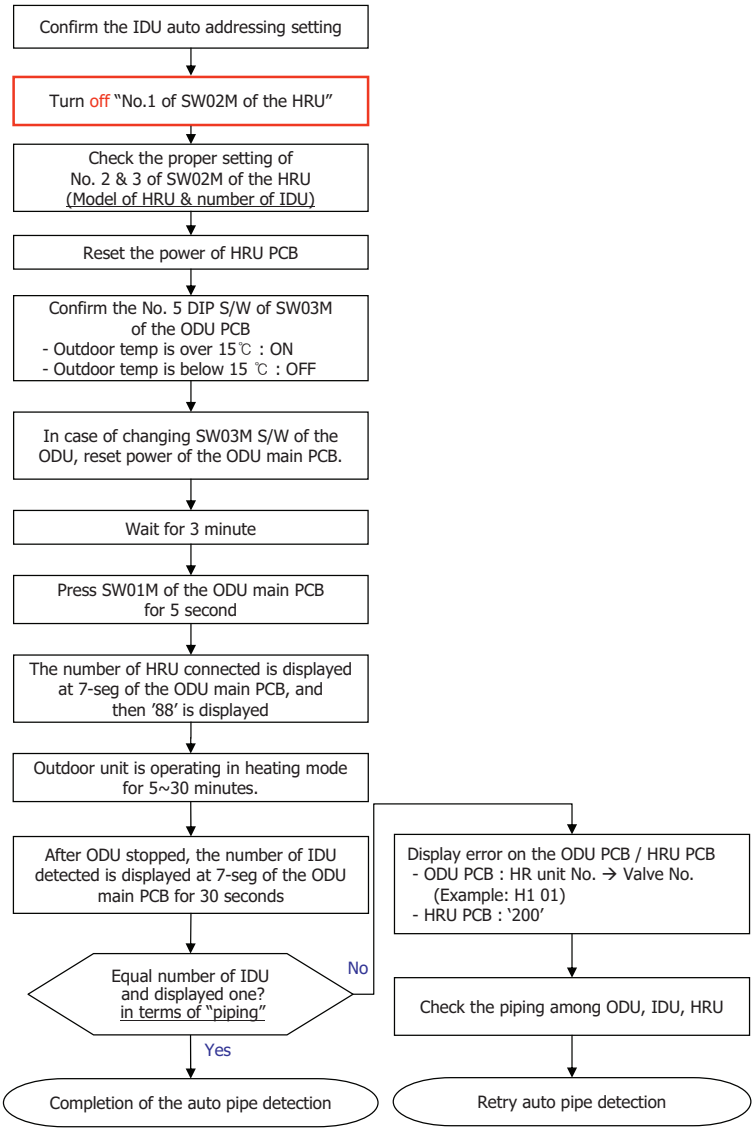
Yes

Completion of the IDU auto addressing

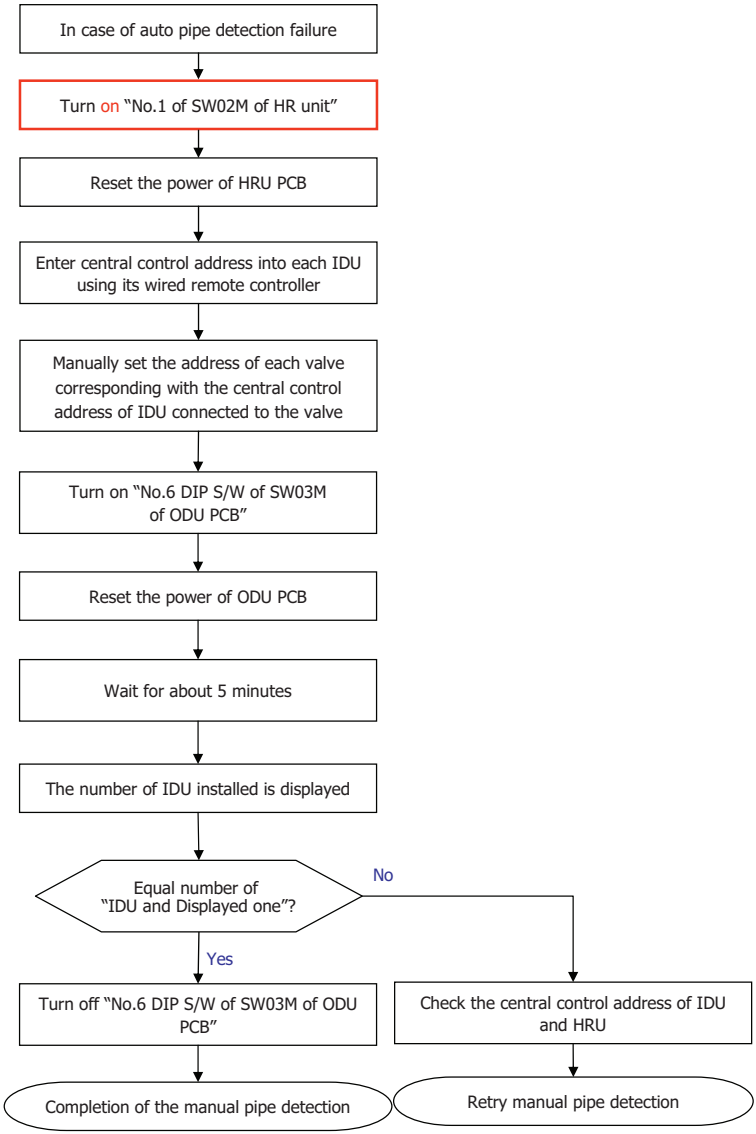
▶ Outdoor unit main PCB



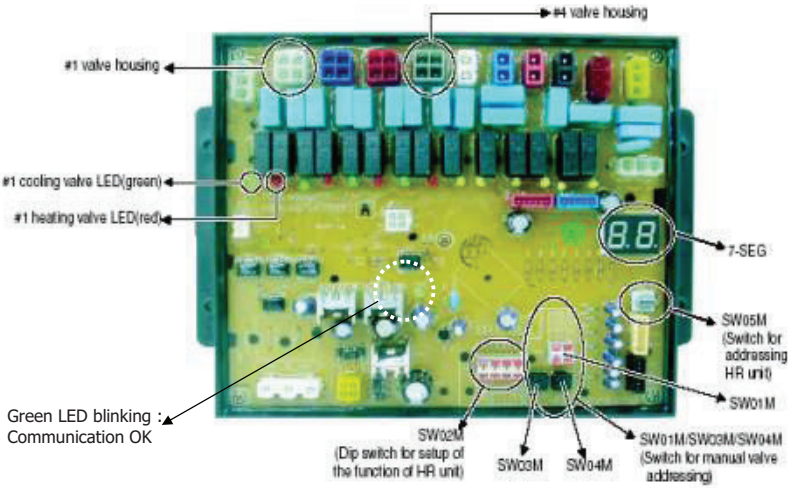
▶ Auto pipe detection


Confirm the IDU auto addressing setting
Turn off "No.1 of SW02M of the HRU"
Check the proper setting of
No. 2 & 3 of SW02M of the HRU
(Model of HRU & number of IDU)
Reset the power of HRU PCB
Confirm the No. 5 DIP S/W of SW03M
of the ODU PCB
- Outdoor temp is over 15℃ : ON
- Outdoor temp is below 15 ℃ : OFF
In case of changing SW03M S/W of the
ODU, reset power of the ODU main PCB.
Wait for 3 minute
Press SW01M of the ODU main PCB
for 5 second
The number of HRU connected is displayed
at 7-seg of the ODU main PCB, and
then '88' is displayed
Outdoor unit is operating in heating mode
for 5~30 minutes.
After ODU stopped, the number of IDU
detected is displayed at 7-seg of the ODU
main PCB for 30 seconds
Equal number of IDU
and displayed one?
in terms of "piping"
No
Yes
Completion of the auto pipe detection
Display error on the ODU PCB / HRU PCB
- ODU PCB : HR unit No. → Valve No.
(Example: H1 01)
- HRU PCB : '200'
Check the piping among ODU, IDU, HRU
Retry auto pipe detection

▶ Manual pipe detection

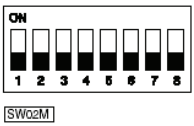

In case of auto pipe detection failure
Turn on "No.1 of SW02M of HR unit"
Reset the power of HRU PCB
Enter central control address into each IDU using its wired remote controller
Manually set the address of each valve corresponding with the central control address of IDU connected to the valve
Turn on "No.6 DIP S/W of SW03M of ODU PCB"
Reset the power of ODU PCB
Wait for about 5 minutes
The number of IDU installed is displayed
Equal number of "IDU and Displayed one"?
No
Yes
Turn off "No.6 DIP S/W of SW03M of ODU PCB"
Check the central control address of IDU and HRU
Completion of the manual pipe detection
Retry manual pipe detection

▶ HR Unit PCB



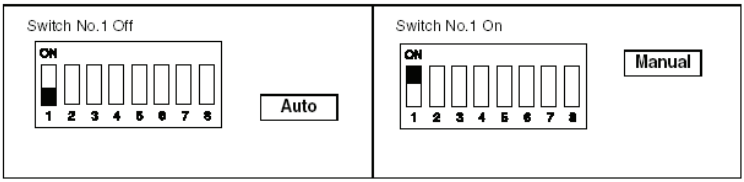
▶ Switch setup of HR Unit

1. Main function of SW02M

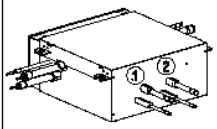
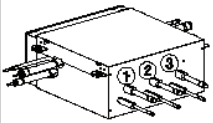
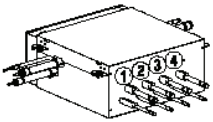
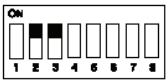
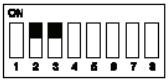


ON S/W	Selection
No.1	Method for addressing valves of an HR unit (Auto/Manual)
No.2	Model of HR unit
No.3	Model of HR unit
No.4	Not used
No.5	Not used
No.6	Not used
No.7	Use only in factory production (preset to "OFF")
No.8	Use only in factory production (preset to "OFF")

1) Selection of the method for addressing valves of an HR unit (Auto/Manual)



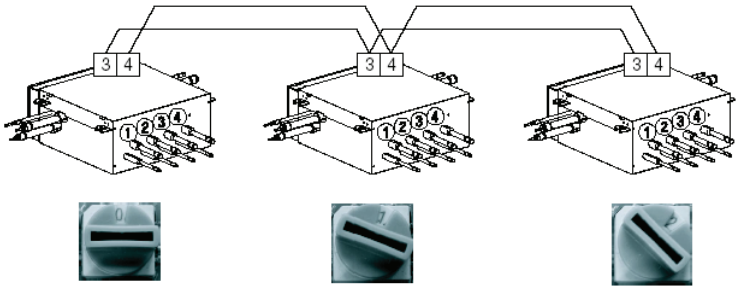
2) Selection of the model of the HR unit

	 (For 2 rooms) PRHR020	 (For 3 rooms) PRHR040	 (For 4 rooms) PRHR040
Initial Setting			
1 room Connected			
2 rooms Connected			
3 rooms Connected			
4 rooms Connected			

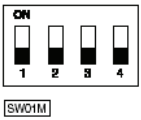
2. SW05M (Rotary S/W for addressing HR unit)

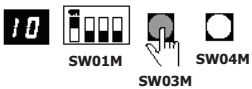
Must be set to '0' when installing only one HR unit.
When installing multiple HR units, address the HR units with sequentially increasing numbers starting from '0'.

Ex) Installation of 3 HR units



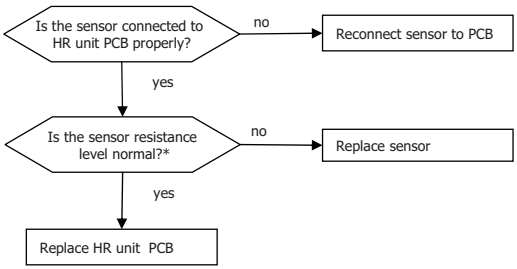
▶ Manual addressing of valves on HR unit PCB (with SW01M, SW03M, SW04M)

	S/W No.	Setup
	No.1	Manual addressing of valve #1
	No.2	Manual addressing of valve #2
	No.3	Manual addressing of valve #3
	No.4	Manual addressing of valve #4
	SW03M	Increase in the digit of 10 of valve address
	SW04M	Increase in the last digit of valve address

No.	Display and setup	Setup and Contents
1		- Operation: None - Display: None
2		- Operatoin : No.1 of SW01M on to address value #1 - Display : Existing value saved in EEPROM is dsplayed in 7-SEG.
3		- Opeation :Set the digit of 10 to the number in Group High data of the wired remote control connected to the corresponding indoor unit to the valve #1 by press SW03M S/W - Display : Digit increasing with the times of press SW03M S/W is displayed in left 7-SEG
4		-Operation : Set the digit of 1 to the number in Group Low data of the wired remote control connected to the corresponding indoor unit to the valve #1 by press SW04M -Display : Digit increasing with the times of press SW04M S/W is displayed in right 7-SEG
5		-Operation : No. 1 of SW01M off to save the address of valve #1 -Display : "11" displayed in 7-SEG disappears

Error Code	Error Contents	Meaning	Main Causes
201(HR unit1) 205(HR unit2) 209(HR unit3) 213(HR unit4) 217(HR unit5) 221(HR unit6) 225(HR unit7) 229(HR unit8)	HR unit liquid pipe temperature sensor error	Abnormal value of sensor measurement (Open / Short)	1. Defective temperature sensor connection 2. Temperature sensor defect(Open/Short) 3. Outdoor unit main PCB defect
202(HR unit1) 206(HR unit2) 210(HR unit3) 214(HR unit4) 218(HR unit5) 222(HR unit6) 226(HR unit7) 230(HR unit8)	HR unit Sub-cooling inlet pipe temperature sensor error	Abnormal value of sensor measurement (Open / Short)	1. Defective temperature sensor connection 2. Temperature sensor defect(Open/Short) 3. Outdoor unit main PCB defect
203(HR unit1) 207(HR unit2) 211(HR unit3) 215(HR unit4) 219(HR unit5) 223(HR unit6) 227(HR unit7) 231(HR unit8)	HR unit Sub-cooling discharge pipe temperature sensor error	Abnormal value of sensor measurement (Open / Short)	1. Defective temperature sensor connection 2. Temperature sensor defect(Open/Short) 3. Outdoor unit main PCB defect

Error diagnosis and countermeasure flow chart

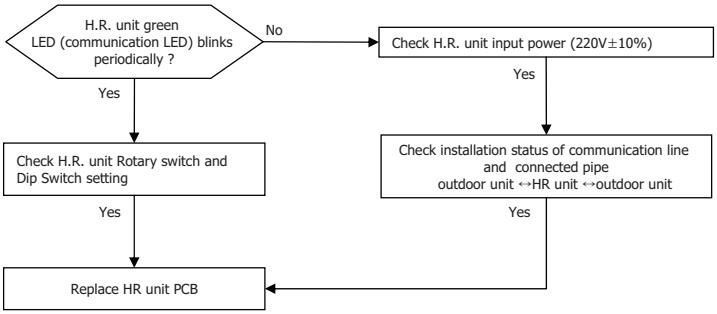


* Sensor resistance 100 kΩ over (open) or 100 Ω below (short) will generate error

Note: Temperate sensor resistance vary with temperature, So compare temperature sensor resistance value according to outdoor unit temperature by referring below table (±5% tolerance)
Air temperature sensor: 10℃ = 20.7kΩ : 25℃= 10kΩ : 50℃= 3.4kΩ
Pipe temperature sensor: 10℃ = 10kΩ : 25℃= 5kΩ : 50℃= 1.8kΩ

Error Code	Error Contents	Meaning	Main Causes
204(HR unit1) 208(HR unit2) 212(HR unit3) 216(HR unit4) 220(HR unit5) 224(HR unit6) 228(HR unit7) 232(HR unit8)	transmission error between the HR unit and outdoor unit	transmission error between the HR unit and outdoor unit	1. Defective connection in HR unit power supply and transmission connection 2. Wrong setting of the HR unit Rotary switch and Dip switch 3. Defective HR unit PCB

Error diagnosis and countermeasure flow chart



[NB] If Indoor units/transmission cables of HR unit and cables of power 220V has been changed each other, transmission parts and indoor will be burnt

Error Code	Error Contents	Meaning	Main Causes
240	Central controller connector error (CNU Connection failure)	transmission failure between central controller and CNU	1. Defective transmission connection 2. Defective CNU 3. Incorrect IP address of central controller or CNU 4. Defective transmission network

Error diagnosis and countermeasure method

1) Check transmission cables are connected correctly or not
2) If central controller is connected to total network, check IP of CNU, central controller
3) Replace CNU

Error Code	Error Contents	Meaning	Main Causes
241	Central controller data transmission error (Sending error)	Central controller to CNU data transmission failure	1. Defective CNU 2. Center controller initialization failure
242	Central controller receive Error (Data receiving error)	CNU to Central controller on time data receiving error	1. Defective CNU 2. Central controller initialization error
243	Central controller receive buffer overflow (In excess data receive)	When data length from CNU is longer than data length defined at protocol	1. Mismatching 2. Defective CNU 3. transmission noise error
244	Central controller receive time out (Receiving time : 3sec ↑)	transmission failure between central controller and CNU	1. Defective CNU 2. Initialization failure of central controller
245	Central controller Send Timeout	Data sending failure from central controller to CNU within designated time	1. CNU defect 2. Initialization failure of central controller
246	Central controller Receive Timeout	Data receiving failure of central controller from CNU within designated time	1. CNU defect 2. Initialization failure of central controller

Error Code	Error Contents	Meaning	Main Causes
250	Central controller Check sum Error	Received check sum is different from calculated check sum data	1. NOISE occurs 2. CNU defect 3. Temporary error of Timing mismatch 4. A/C product defect 5. PI485 communication cable open or connection defect
251	Central controller Receive Zero Error	Length of received data : 0	1. NOISE occurs 2. CNU defect 3. Temporary error of Timing mismatch 4. A/C product defect 5. PI485 communication cable open or connection defect
252	Central controller Wrong Address Error	Setting address and actual address are different each other	1. NOISE occurs 2. CNU defect 3. Temporary error of Timing mismatch 4. A/C product defect 5. PI485 communication cable open or connection defect
253	Central controller Disconnection Error	No response from air conditioner	1. NOISE occurs 2. CNU defect 3. Temporary error of Timing mismatch 4. A/C product defect 5. PI485 communication cable open or connection defect

Error diagnosis and countermeasure method

1) Check system setting address of central controller and actual address is matched or not
2) Re-start service program(engine) of central controller
3) Replace CNU

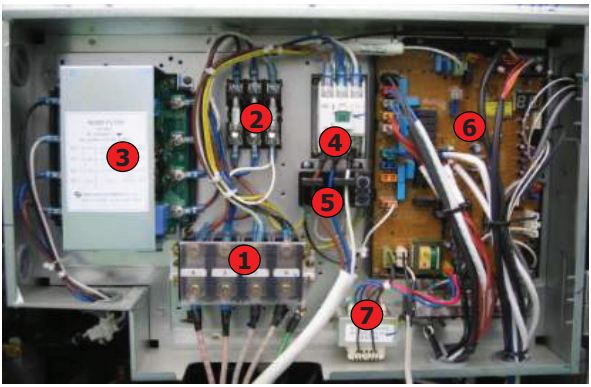
MEMO

3. Electric Component Check

LG Electronics Inc.

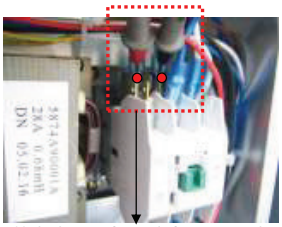
3.1 How to check main control box?

(a) Plus

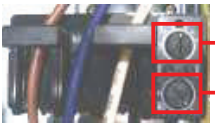
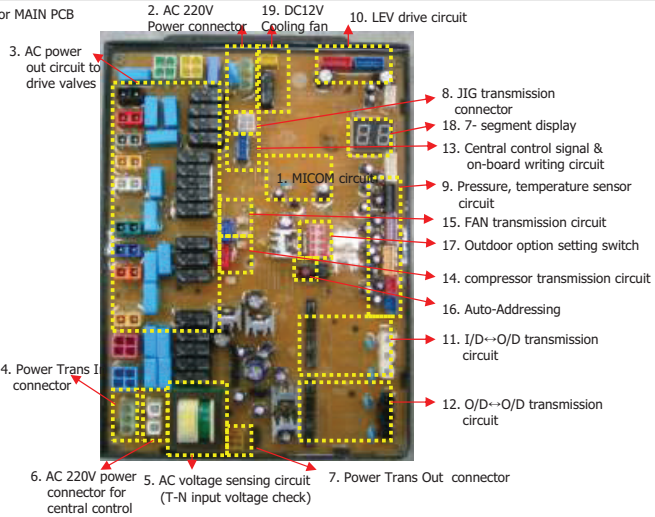


No.	Part (Function)	Check points	How to check?	Counter-measure
1	T/BLOCK (Terminal Block, Input power)	Check voltage	- Voltage of 3ϕ(R,S,T) should be within 380±10% - Voltage of 1ϕ(R-N,S-N,T-N) should be within 220±10%. - Voltage fluctuation should be within 10V - While stand-by and in operation, Voltage drop should be within 10V Checking points of 3ϕ(R-S) Checking points of 1ϕ(R-N)	-Check supply power and connection condition
		Check Ω (In case power is not supplied)	- Resistance of R-S,S-T,R-T,R-N,S-N should be more than a few kΩ - Resistance of T-N should be within 40~50Ω (Main transformer of outdoor)	-Check short or not of Control box (Noise filter, PCB, cables) - Replace transformer
2	FUSE (Protect over-loaded current)	Check disconnection of FUSE (when power is supplied)	- Voltage of fuse should be within 0~1V Checking points of R ϕ fuse	-In case of 220V, Fuse is disconnected. → Replace FUSE
		Check disconnection of FUSE (when power is not supplied)	-Resistance of fuse should be within 0~1Ω	-In case resistance is ∞, Fuse is disconnected. → Replace FUSE

(a) Plus

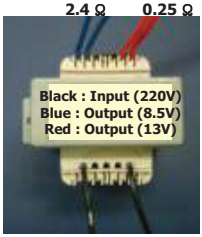
No.	Part (Function)	Check points	How to check?	Counter-measure
3	Nose filter (Noise emit & protect)	Check voltage (When power is Supplied)	-Voltage of each connector (R-R,S-S,T-T) should be within 0~40V Plus Plus II	- In case of 220V It is disconnected → Replace noise filter
		Check Ω (In case power Is not supplied)	-Resistance of each connectors (R-R,S-S,T-T) should be within 0~10Ω	-In case resistance is ∞, noise filter is disconnected. → Replace noise filter
4	Magnet switch	Magnet switch 1st coil	-When check resistance of 1st coil of magnet switch, resistance should be 0.47 kΩ (When power is not supplied) When magnet switch is on, voltage should be 220V (When power is not supplied)  ** check point of 1st coil of magnet switch	-In case resistance is ∞ or 0 Ω, → Replace Magnet switch -When voltage is not 220V, magnet switch is melt down - Replace magnet switch
		Magnet switch connection check (In case power is not supplied)	-While pressing green button of magnet switch, Voltage of each connectors should be 0V or Resistance should be 0~1Ω (Warning: power should not be supplied)	- Replace magnet switch

(a) Plus

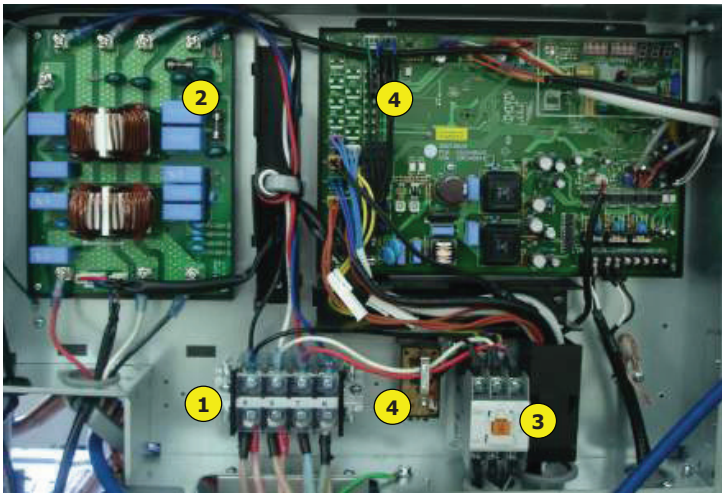
No.	Part (Function)	Check points	How to check?	Counter-measure
5	EOCR (Cut off over-loaded current to protect constant compressor)	Time, Current Rotary switch Setting	-Rotary switch setting should be correct (Current:30~40A, Time:5sec) 	
		Connection condition	-R cable and T cable should be connected each other	
6	Outdoor MAIN PCB  2. AC 220V Power connector 19. DC12V Cooling fan 10. LEV drive circuit 3. AC power out circuit to drive valves 8. JIG transmission connector 18. 7- segment display 13. Central control signal & on-board writing circuit 1. MICOM circuit 9. Pressure, temperature sensor circuit 15. FAN transmission circuit 17. Outdoor option setting switch 14. compressor transmission circuit 16. Auto-Addressing 11. I/D↔O/D transmission circuit 4. Power Trans I connector 12. O/D↔O/D transmission circuit 6. AC 220V power connector for central control 5. AC voltage sensing circuit (T-N input voltage check) 7. Power Trans Out connector			

Defect	Check point	How to check?	Counter-measure
No power at PCB	2.Power terminal 2.Power terminal 7.Transformer	-Input voltage should be 220V. (when power is supplied) -Input resistance should be more than a few kΩ(when power is not supplied) -Output voltage should be 14V,9V	-Check fuse(3.15A), T-N voltage →-If resistance is 0~100Ω , replace PCB -Check transformer and connection
No trans-mission	11.I/D↔O/D 12.O/D↔O/D 14.Inverter compressor 15.Inverter fan	-DC voltage of connectors should be various (-7V~+7V) -Yellow LED should blink. -Green LED should blink	-Replace PCB, transformer and check connection points -Check Main / Inverter compressor PCB and connection points -Check Main / Inverter fan PCB
In case PCB AC power output is 0	3. AC 220V output to drive valves and others	-Voltage of PCB should be 220V at LGMV -Output voltage should be showed as below Sensor(5V), Cooling fan(12V),LEV(12V)	-Replace PCB and check connection points -Replace PCB and check connection points

(a) Plus

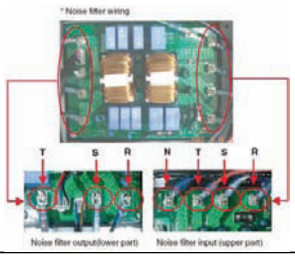
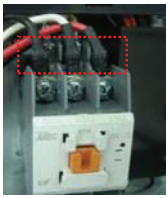
No.	Part (Function)	Check points	How to check?	Counter-measure
7	Outdoor transformer (Supplies power to PCB and transmission)	Coil resistance (when power is not supplied)	1st side : 42Ω 2nd side :2.4Ω, 0.25Ω **2.4 Ω** **0.25 Ω**  **42 Ω**	-Replace transformer and check connection points
		In/Output voltage (when power is supplied)	1st side : 220V (AC) 2nd side : 14V, 9V(AC)	-Replace transformer and check connection points

(b) Plus II



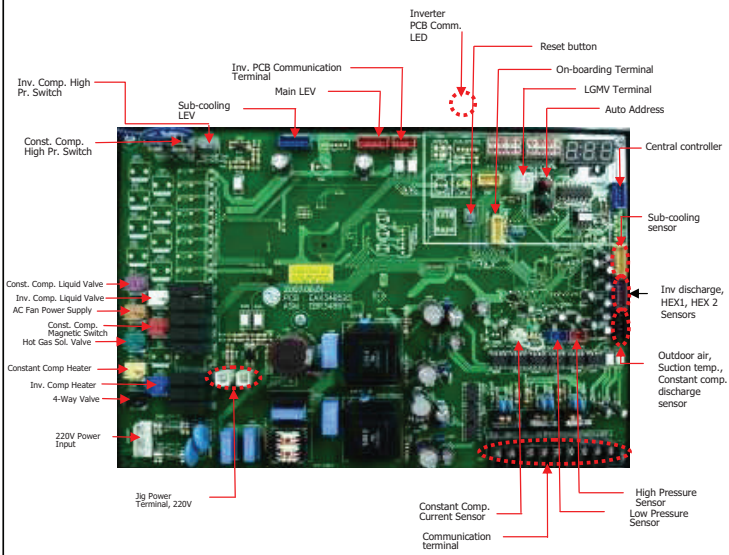
No.	Part (Function)	Check points	How to check?	Counter-measure
1	T/BLOCK (Terminal Block, Input power)	Check voltage	- Voltage of 3φ(R,S,T) should be within 380±10% - Voltage of 1φ(R-N,S-N,T-N) should be within 220±10%. - Voltage fluctuation should be within 10V - While stand-by and in operation, Voltage drop should be within 10V Checking points of 3φ(R-S) Checking points of 1φ(R-N)	-Check supply power and connection condition
		Check Ω (In case power is not supplied)	- Resistance of R-S,S-T,R-T,R-N,S-N,T-N should be more than a few kΩ	-Check short or not of Control box (Noise filter, PCB, cables) - Replace transformer

(b) Plus II

No.	Part (Function)	Check points	How to check?	Counter-measure
2	Nose filter (Noise emit & protect)	Check voltage (When power is Supplied)	-Voltage of each connector (R-R,S-S,T-T) should be within 0~40V 	- In case of 220V It is disconnected → Replace noise filter
		Check Ω (In case power Is not supplied)	-Resistance of each connectors (R-R,S-S,T-T) should be within 0~10Ω	-In case resistance is ∞, noise filter is disconnected. → Replace noise filter
3	Magnet switch	Magnet switch 1st coil (Constant speed compressor)	-When check resistance of 1st coil of magnet switch, resistance should be 0.47 kΩ (When power is not supplied) When magnet switch is on, voltage should be 220V (When power is not supplied)  ** check point of 1st coil of magnet switch	-In case resistance is ∞ or 0 Ω, → Replace Magnet switch -When voltage is not 220V, magnet switch is melt down - Replace magnet switch
4	CT Current Sensor	Current to Constant Compressor	-Check wiring	

(b) Plus II

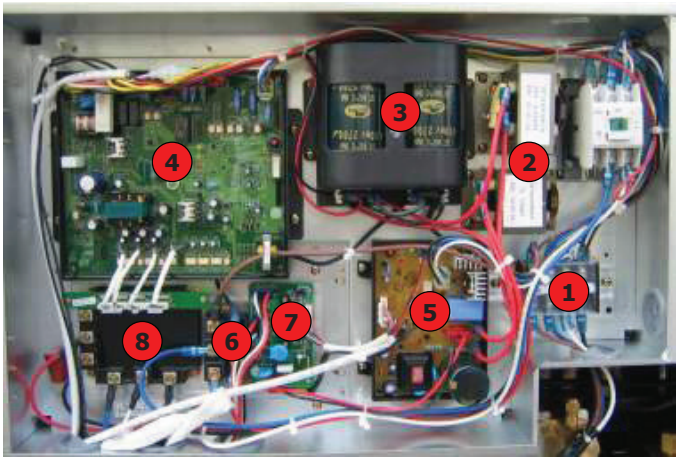
No.	Part (Function)	Check points	How to check?	Counter-measure
6	Outdoor MAIN PCB			

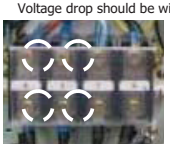
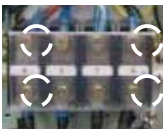


Defect	Check point	How to check?	Counter-measure
No power at PCB	2.Power terminal 2.Power terminal	-Input voltage should be 220V. (when power is supplied) -Input resistance should be more than a few kΩ(when power is not supplied)	-Check fuse(3.15A), T-N voltage →-If resistance is 0~100Ω , replace PCB
No trans-mission	I/D↔O/D O/D↔O/D 14.Inverter compressor	-DC voltage of connectors should be various (-7V~+7V) -Yellow LED should blink.	-Replace PCB and check connection points -Check Main / Inverter compressor PCB and connection points
In case PCB AC power output is 0	3. AC 220V output to drive valves and Others	- Check Noise filter output -Voltage of PCB should be 220V at LGMV -Output voltage should be Sensor(5V), Cooling fan(220V),LEV(12V)	-Replace Noise filter -Replace PCB and check connection points

3.2 How to check inverter control box?

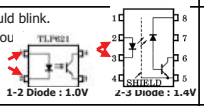
(a) Plus



No.	Part (Function)	Check points	How to check?	Counter-measure
1	T/BLOCK (Terminal block, Power input)	Check voltage (When power is supplied)	- Voltage of 3φ(R,S,T) should be within 380±10% - Voltage of 1φ(R-N,S-N,T-N) should be within 220±10%. - Voltage fluctuation should be within 10V - While standby and in operation, Voltage drop should be within 10V   Checking points of 3φ(R-S) Checking points of 1φ(R-N)	- Check supply voltage & connection points Check noise filter, fuse
2	REACTOR (DC voltage stabilization)	Resistance of connectors & connection condition	- Resistance of reactor should be within 1~3Ω (When power is not supplied) - Voltage between terminals of reactor should be within 0~1V (When power is supplied) ***Reactor for INV compressor Reactor for INV Fan	- In case resistance is ∞, coil is disconnected. → Replace reactor

(a) Plus

Loc.	Part (Function)	Check points	How to check?	Counter-measure
3	Capacitor (To charge DC voltage for inverter compressor)	Electric capacity. (when power is not supplied)	- Electricity capacity of capacitor must be 2600~2800㎌ and the resistance of capacitors should be more than a few kΩ * Check values at both terminal of capacitor	- Replace capacitor when value is more or less than normal spec.
		DC charging voltage (When power is supplied)	- Charged voltage of between terminals of capacitor (= between IPM P-N terminal = DC link terminals) should be more than 450V (At the moment of inverter compressor start)	- Check input voltage and replace capacitor
4	INV compressor PCB	2. Power & start-relay drive circuit 3. High pressure switch & power-relay drive circuit 4. DC-Link sensing & display circuit 6. transmission circuit to main PCB 5. Checking circuit for reverse phase of input power 7. On-board writing connector 1. MICOM circuit 9. PWM driving signal output circuit 8. CT sensing circuit		

Phenomena	Check point	How to check?	Counter-measure
No power at PCB	2.Power	-Input voltage should be 220V. (when power is supplied) -Input resistance should be more than a few kΩ (when power is not supplied)	- Check & replace fuse(3.15A), T-N voltage (220V) - If resistance value is 0~100Ω , replace PCB
No transmission	6.Transmission circuit to main PCB	-Yellow LED should blink.	- Check yellow LED blinks or not - When is OFF, check transmission with main PCB and replace
Malfunction of inverter compressor	9.PWM signal cable	-Green LED should blink. -Check IC port cou of PWM drive (when power is not supplied) 	- Replace PCB
Inverter compressor PCB Error	Red LED	-When red LED blinks. Error displays about inverter compressor PCB	-Check error code displayed at main PCB

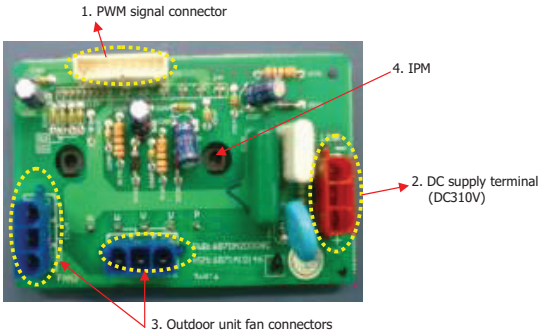
(a) Plus

Loc.	Part (Function)	Check points	How to check?	Counter-measure
5	Inverter fan PCB	1. MICOM circuit 2. Input circuit of 3ϕ & DC rectifying circuit 3. In/Output connector of reactor 4. DC-Link output voltage 5. DC-Link electrolytic capacitor 6. SMPS power circuit 7. PWM drive circuit 8. Heat sink temperature sensor connector 9. On-boarding lighting connector 10. Comm. circuit		

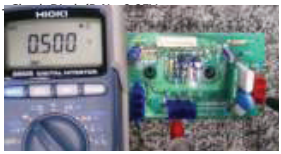
Phenomena	Check point	How to check?	Counter-measure
No power on PCB	2.3ϕ power Input circuit	- Input voltage of 3ϕ 4 wires should be 3ϕ 380V, 1ϕ 220V - Check half wave rectifying circuit diode R, S, T, N Reactor 1 R(+) - Reactor1(-) : 0.6V	-Check supply voltage, noise filter, fuse -Replace inverter fan PCB
No transmission	10. Transmission circuit with main PCB	-Yellow LED should blink.	-Check yellow LED blinks or not -When is OFF / ON continuously, check transmission with main PCB
Inverter fan PCB error	Red LED	-When red LED blinks, error code happens about inverter fan PCB	-Check error code at main PCB

6	3ϕ DIODE	Check voltage & resistance of each phases (when power is not supplied)	 P-U :DIODE(0.4V) resistance(a few MΩ)	 P-V :DIODE(0.4V) resistance(a few MΩ)	 P-W :DIODE(0.4V) resistance(a few MΩ)
			 N-U :DIODE(0.4V) resistance(a few MΩ)	 N-V :DIODE(0.4V) resistance(a few MΩ)	 N-W :DIODE(0.4V) resistance(a few MΩ)

(a) Plus

<table>
<tr><th>No.</th><th>Part
(Function)</th><th>Check
points</th><th>How to check?</th><th>Counter-measure</th></tr>
<tr><td>7</td><td>Inverter
fan
IPM PCB</td><td colspan="3"> 
</td></tr>
</table>

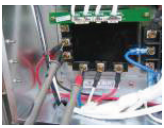
<table>
<tr><th>Phenomena</th><th>Check point</th><th>How to check?</th><th>Counter-measure</th></tr>
<tr><td>Inverter fan
is not rotating</td><td>1.PWM signal
2.Fan DC power
3.Outdoor
fan connector

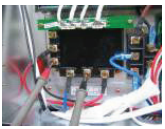
4. IPM</td><td>- Check 9pin connectors
- DC voltage should be charged of 310V
- While Fan operating, in case voltage of
connectors(U-V,V-W,U-W) is 100~300V
→ Normal
 
Check DIODE(P-U : 0.5V)</td><td>- Replace cables & check
soldering condition of PCB
- Replace connectors & inverter
PCB if not charging

- Replace inverter IPM PCB</td></tr>
</table>

<table>
<tr><td>8</td><td>IPM</td><td>Check voltage
& resistance
of
each phases
(When power
is not
supplied)</td><td>

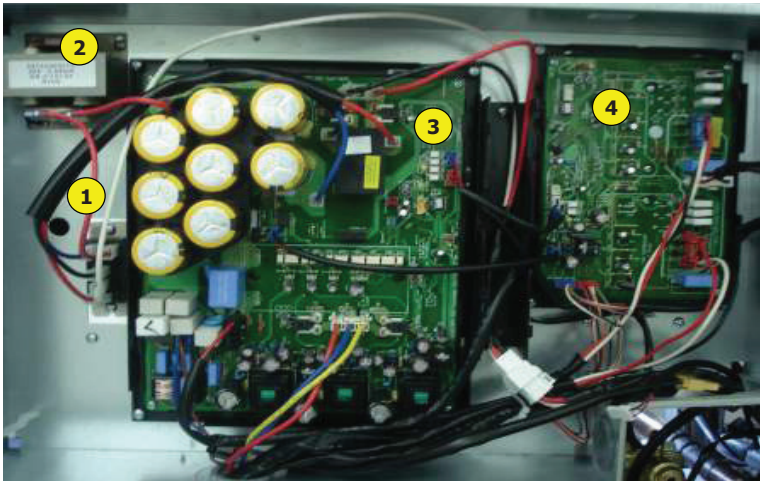
P-U :DIODE(0.4V)
resistance(a few MΩ)

P-V :DIODE(0.4V)
resistance(a few MΩ)

P-W :DIODE(0.4V)
resistance(a few MΩ)

N-U :DIODE(0.4V)
resistance(a few MΩ)

N-V :DIODE(0.4V)
resistance(a few MΩ)

N-W :DIODE(0.4V)
resistance(a few MΩ)
</td></tr>
</table>

(b) Plus II

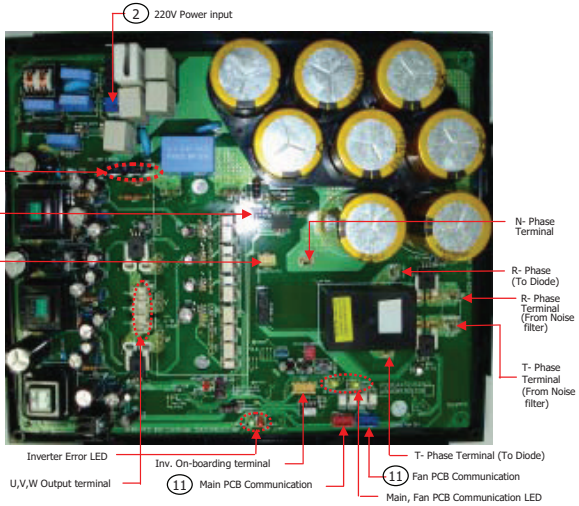


Phenomena	Check point	How to check?	Counter-measure
REACTOR (DC voltage stabilization)	Resistance of connectors & connection condition	- Resistance of reactor should be within 1~3Ω (When power is not supplied) - Voltage between terminals of reactor should be within 0 ~1V (When power is supplied)	- In case resistance is ∞, coil is disconnected. → Replace reactor
3ϕ DIODE	Check voltage & resistance of each phases (when power is not supplied)	⊖ ⊕ ⊖R ⊖S T -In case the measured value is different from the table, set multi tester to resistance mode and measure. If the value is small (0 Ω) or high (hundreds M Ω), PCB needs to be replaced. - In case that bridge diode is damaged, check if inverter PCB assembly (IPM) is needed to be replaced.	

Diode terminal / Tester terminal	+ terminal: black(-)	- terminal: red(+)
R(~) : red(+)	0.4 V ~ 0.7 V	-
S(~) : red(+)	0.4 V ~ 0.7 V	-
T(~) : red(+)	0.4 V ~ 0.7 V	-
R(~) : black(-)	-	0.4 V ~ 0.7 V
S(~) : black(-)	-	0.4 V ~ 0.7 V
T(~) : black(-)	-	0.4 V ~ 0.7 V

✻ Red(+) and black(-) are the measuring terminals of multi tester.

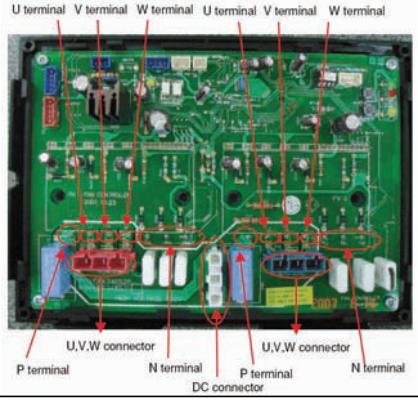
(b) Plus II

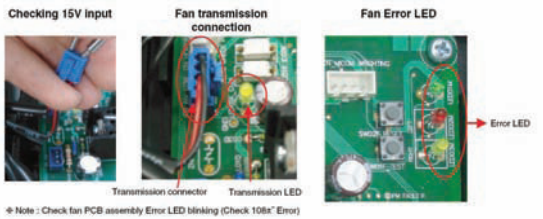
Loc.	Part (Function)	Check points	How to check?	Counter-measure
4	Inverter fan PCB			

2 220V Power input
700 DC Link
DC 15V Output terminal
PFC On-boarding terminal
N- Phase Terminal
R- Phase (To Diode)
R- Phase Terminal (From Noise filter)
T- Phase Terminal (From Noise filter)
Inverter Error LED
Inv. On-boarding terminal
U,V,W Output terminal
11 Main PCB Communication
T- Phase Terminal (To Diode)
11 Fan PCB Communication
Main, Fan PCB Communication LED

Phenomena	Check point	How to check?	Counter-measure
No power at PCB	2.Power	-Input voltage should be 220V. (when power is supplied) -Input resistance should be more than a few kΩ (when power is not supplied)	-T-N voltage (220V) -If resistance value is 0~10, replace PCB
No transmission (Main PCB) (Fan PCB)	10.Transmission circuit to main, fan PCB	-LEDs should blink.	- Check LED blinks or not - When is OFF, check transmission with main, fan PCB
Inverter compressor PCB Error	12. PWM LED	-When red LED blinks. PWM is normal	-Check error code displayed at main PCB

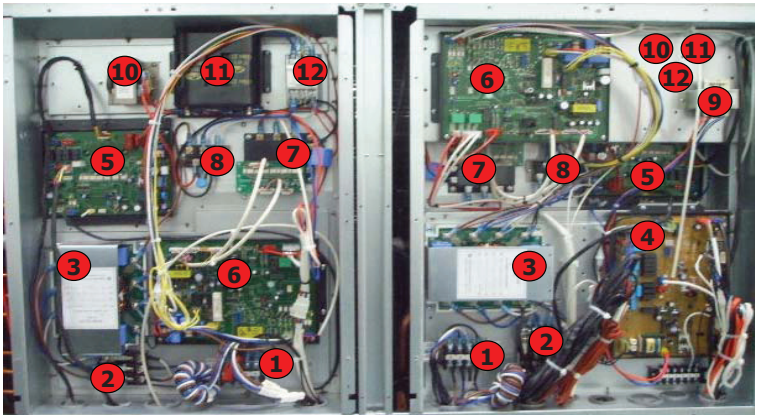
(b) Plus II

Loc.	Part (Function)	Check points	How to check?	Counter-measure
4	Inverter fan PCB		 U terminal V terminal W terminal U terminal V terminal W terminal U,V,W connector U,V,W connector P terminal N terminal P terminal N terminal DC connector	

Phenomena	Check point	How to check?		Counter-measure
DC link voltage check and IPM check* * IPM check: After disconnecting all connector		**P terminal : black (-)**		**N terminal : red (-)**
	U terminal : red(+)	35K Ω ± 10%		Open
	V terminal : red(+)	35K Ω ± 10%		Open
	W terminal : red(+)	35K Ω ± 10%		Open
		P terminal : red(+)		**N terminal : red (+)**
	U terminal : black(-)	Open		35K Ω ± 10%
	V terminal : black(-)	Open		35K Ω ± 10%
	W terminal : black(-)	Open		35K Ω ± 10%
No transmission	10. Transmission circuit with Inverter PCB	-Yellow LED should blink.		-Check yellow LED blinks or not -When is OFF / ON continuously, check transmission with main PCB
	 Checking 15V input Fan transmission connection Fan Error LED Error LED Transmission connector Transmission LED ※ Note : Check fan PCB assembly Error LED blinking (Check 108x" Error)			
Inverter fan PCB error	Red LED	-When red LED blinks, error code happens about inverter fan PCB		-Check error code at main PCB

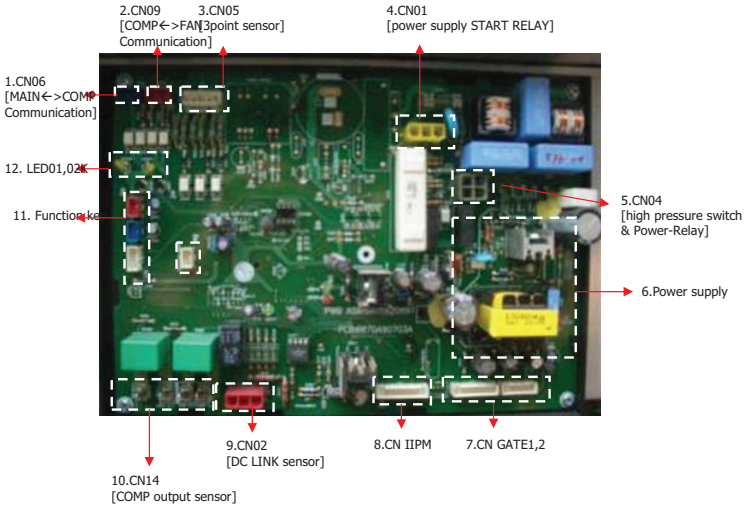
3.3 How to check Multi V Space control box?

*** MUTLI V SPACE 10HP C/BOX**



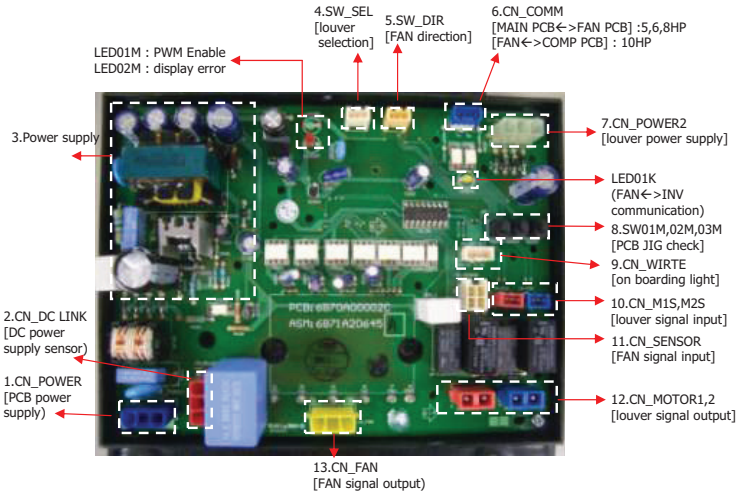
N2(COMP B,FAN B)			N1(MAIN control + COMP A,FAN A)		
NO	**Name**	**Function**	**NO**	**Name**	**Function**
1	T/BLOCK	3 phase 4 line power input	1	T/BLOCK	3 phase 4 line power input
2	FUSE	Excessive electric blockade (30A)	2	FUSE	Excessive electric blockade(30A)
3	Noise filter	Block and discharge noise	3	Noise filter	Block and discharge noise
-	-	-	4	MAIN PCB	LOGIC control of the whole product
5	FAN PCB	BLDC FAN control	5	FAN PCB	BLDC FAN control
6	COMP PCB	BLDC COMP control	6	COMP PCB	BLDC COMP control
7	IPM	Switching degauss ,(COMP output)	7	IPM	Switching degauss ,(COMP output)
8	DIODE	3 phase power commutation degauss (+)	8	DIODE	3 point phase commutation degauss (+)
			9	TRANSE	Supply MAIN PCB power
10	REACTOR	DC voltage stabilization and power factor beveling	10	REACTOR	DC voltage stabilization and power factor beveling
11	CAPACITOR	DC voltage recharge (COMP,FAN)	11	CAPACITOR	DC voltage recharge (COMP,FAN)
12	Magnet S/W	BLDC COMP switch	12	Magnet S/W	BLDC COMP switch

Multi V SPACE COMP PCB

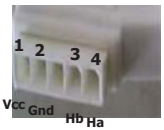


Situation	Monitoring Location	How to check?	Counter-measure
PCB power does not turn on	4.CN01 (CH52)	-input voltage must be 220V (power on) -input resistance is over kΩ.(power off)	-LINE FUSE(3.15A) manage after checking input voltage 220V -replace PCB if the resistance is 0~100Ω
Communication does not work	1.CN06 2.CN09 (CH52)	-yellow LED(LED01,02K)must flick.	-check communication and FAN PCB and MAIN PCB if the yellow LED is flick or OFF (check connection and replace PCB)
COMP malfunction	10.CN14 9.CN02 8.CNIPM 7.CN_GATE (CH21 CH22 CH23)	-constant COMP output U(-),V(-),W -DC voltage within 470V~520V -check connection status	-replace after checking PCB and COMP if the difference is over 2A -replace after checking CAPACITOR and PCB Replace and check motor and connection
Deficiency error	3.CN05 (CH54)	-3 point power line (noise filter latter part) over 380V	- Readjust and Replace after checking FUSE, input power , connection line

Multi V SPACE BLDC FAN PCB



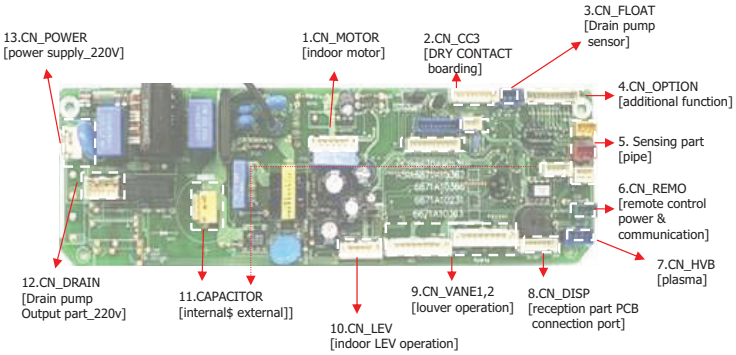
Situation	Monitoring Location	How to check?	Counter-measure
Power does not turn on	1.CN POWER	-AC voltage measure 220V	-Input voltage (220V)
	3. Power supply (CH105)	- ZNR01D(barrister),FUSE burn out checkup	-Replace related parts
FAN motion disabled	2.CN_DC LIINK	-DC 470V~520V displays -DC 380V and above are normal	- Check and replace CAPACITOR - Replace PCB
	13.CN_FAN(CH106) 11.CN_SENSOR(CH67)	- U,V,W electric flow measurement stabilize -Check connectors	Check up and replace connection and motor
communication does not work	6. CN-COMM (CH105)	-Flick LED01K - check connector and PCB (power supply ,communication)	-Check PCB power supply(220V) -Check and replace connector and PCB
Louver does not work	4.SW_SEL	-Check if connector is connected	- connect connectors (if there are no louver)
	7.CN_POWER2	-DC24V display check	-Check and Replace trance and power supply
	10.CN_M1S,M2S	-Connection status check	-Check and replace louver motor and connection part
	12.CN_MOTOR1,2	- Connection status check	- Check and replace louver motor and connection part



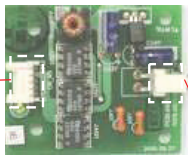
***BLDC motor monitoring method**

Ha(4),Hb(3) ←--→ Gnd(2) : 24MOhm
Ha(4),Hb(3) ←--→ Vcc(1) : 11KOhm

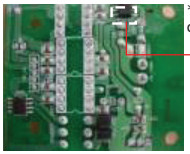
3.4 How to check indoor unit PCB?



* Outdoor unit communication PCB front side



Outdoor unit communication PCB backside



* When there is communication error(U01Y)

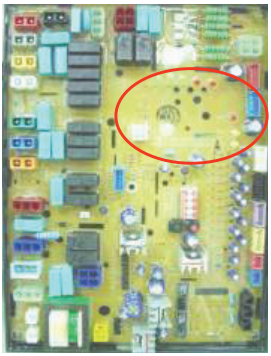
DIODE MODE measurement
8-1,2,3,4 : 1.2V
5-1,2,3,4 : 0.7V

Situation	Monitoring Location	How to check?	Counter-measure
PCB, remote control power does not come on	13.CN_POWER	-input voltage must be 220V.(power on) - Barrister (ZNR01N),FUSE,,PCB check	-manage and check input voltage 220V -replace and check relate parts
Communication does not work	14.CN_A5 communication PCB	-check connection -Check connection PCB latter U01Y -- green LED flick (flick initially)	-readjust and check connection -Replace and check IC(DIODE) -Replace after checking communication PCB and indoor unit PCB power supply
Outdoor unit motor does not work	1.CN_MOTOR 11.CAPACITOR	-Error CH10(FAN LOCK) when it does not operate after remote control operation -DC 310V is recharged	-replace and check motor and connection Replace CAPACITOR
Outdoor unit sensor error (CH01,02,06)	5. sensor	-is LG MV sensor value normal?	-replace and check connection and sensor part
Outdoor unit front panel reception defect and remote control does not work	8.CN_DISP	-check indoor unit front panel LED operation - Wireless remote control and forced operation switch operation	-reception PCB and connection part reception PCB and connection part
Indoor unit leakage	12.CN_DRAIN 3.CN_FLOAT	-DRAIN display AC 220V -CH04 display or DRAIN operation	-replace PCB - Replace DRAIN pump and check connection status
CH03 and remote control does not work	6.CN_REMO	-When remote control operate and when indoor unit operation --intermittent CH03 occurrence automatic ON/OFF	-remote control, indoor unit PCB check -eliminate noise and check communication line connection status check remote control SETTING

3.5 How to check other electric components?

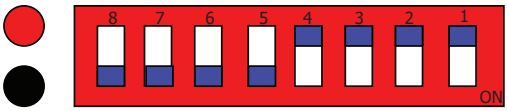
(a) Plus

<table>
<tr><th>Name</th><th>Check Loc.</th><th>Check points</th></tr>
<tr><td rowspan="2">Display Value of main PCB in outdoor unit</td><td>Outdoor unit main PCB display Value (At the moment that power is supplied)</td><td>Main PCB

5 sec later after power input,
4X Main model name
50 Sub1(when connected)
50 Sub2(when connected)
XX Total operation capacity in Hp
(Ex: 20 Hp → 20)
25 Normal state
Others : PCB checking mode
22 In case of R22 refrigerant
R410A: 41</td></tr>
<tr><td>Outdoor sub unit PCB display Value (When power is supplied) display condition)</td><td>Sub PCB
 
LED 8 7 6 5 4
LED 3
LED 2
LED 1
40 sec later after power input,
LED1(blinking): Display normal micom condition
LED2, 3(On): Back-up for left/right compressor
LED4 : reserved
LED5(blinking) : Communicate with main
LED6(On) : Reverse connection at sub unit
LED7(On) : Right compressor is in operation
LED8(On) : Left compressor is in operation</td></tr>
</table>

(a) Plus

Name	Check point
Outdoor unit PCB DIP switch	◈ Dip switch Setting ◈



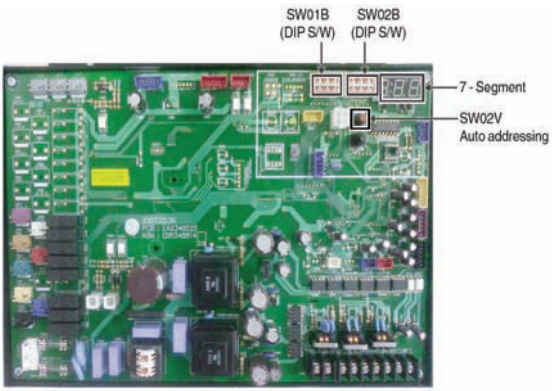
1. Main unit

DIP s/w	RE SET	Function	Method / description
1	X	Cooling operation control	No. 1 ON→ push RED button 3 times for 3 sec. → display 01, 0F by turns (#1 indoor unit OFF) → Push BLACK button for 3 sec. → display 01,0P by turns → A few sec. later display 01, 0N by turns (#1 indoor unit ON) → Push RED button for 1 sec. → display 02, 0F by turns (#2 indoor unit OFF) → (go on…)
1	O	SAVE MODE	No.1 ON → RESET / Target high pressure down, target low pressure up
2	O	CAPACITY UP	No.2 ON → RESET / Target high pressure down, target low pressure up
1,2	X	Heating operation control	No.1, No.2 ON / Same process as cooling operation
3	O	Inverter compressor BACKUP operation	No.3 ON → RESET / while inverter compressor failure, operate more than indoor unit capacity (SINGLE:70K,SERIES:110K)
4	O	Constant compressor 1 BACKUP operation	No.4 ON → RESET / while constant compressor failure, operate more than indoor unit capacity (SINGLE:70K,SERIES:110K)
3,4	O	MAIN UNIT BACKUP	No.3, No.4 ON → RESET / when MAIN unit failure
5	O	Cooling operation LOCK	No.5 ON → RESET / locking cooling operation mode
6	O	Heating operation LOCK	No.6 ON → RESET / locking heating operation mode
7	X	Forced oil return operation	No.7 ON → Push BLACK button for 2 sec. → display 01(Oil return)

2. Sub unit

DIP s/w	RE SET	Function	Method / description
3	O	Constant compressor 1 BACKUP operation	No.3 ON → RESET / while constant compressor1(left) failure, operate more than indoor unit capacity (SINGLE:70K,SERIES:110K)
4	O	Constant compressor 2 BACKUP operation	No.4 ON → RESET / while constant compressor2(right) failure, operate more than indoor unit capacity (SINGLE:70K,SERIES:110K)
5	O	SUB1(2UNIT)	No.3 ON → RESET / SUB1 recognition (2UNIT)
6	O	SUB2(3UNIT)	No. 4 ON → RESET / SUB2 (3UNIT)
5,6	O	SUB3(4UNIT)	No.3, No.4 ON → RESET / SUB3 recognition (4UNIT)

(b) Plus II

Name	Check Loc.	Check points
Display Value of main PCB in outdoor unit	Outdoor unit main PCB display Value (At the moment that power is supplied)	

Initial setup

There are 4 initial setup steps before running.
All DIP switch setting must be completed before initial setup.
1) Step 1 : factory setting value display
Factory setting value is displayed in 7 segment on PCB for 24sec.
All dip switches must be set properly before step 1.

Power is on

Master model code is displayed (3sec)

Slave1 model code is displayed (3sec)

Slave2 model code is displayed (3sec)

Total capacity including sub units is displayed (2sec)

Heat pump : Display 2 is default value
Cooling only : no display

Example) 30HP, R410A
63 → 63 → 63 → 30 → 2 → 25 → 41

Factory setting(25 is normal)

Refrigerant display

(b) Plus II

2) Step 2 : Communication check
- If all model code is displayed in 7 segment including all Slave unit, communication between outdoor units is normal.
- If 104* is displayed in 7-segment, check communication wires between outdoor units and Dip switch setting.

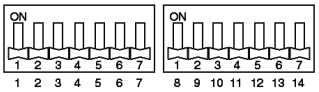
3) Step 3 : PCB error check
- After 40 sec, error check begins.

■ Main unit
- All errors of units including Slave units are displayed in 7 segment.
- If communication between main PCB and inverter PCB isn't normal, 52* is displayed in 7-segment
  If communication between main PCB and fan PCB isn't normal, 105* is displayed in 7-segment.
  If error is displayed, check corresponding wires.

■ Sub unit
- After 40 sec, LED1 blinks once per second.
- If electric phase is reversed or missed, LED6 is on.
- Other LED' except LED1 must be off in initial setup steps.

4) Step 4 : Auto addressing of indoor units
- Auto addressing begins when address(red) button in Main PCB is pressed for 6 sec.
- During auto addressing, 7 segment on main PCB displays "88"
- After auto addressing, the number of indoor units is displayed in 7 segment for 30 sec. The address of each indoor unit is displayed on each wired remote controller.

Push address(red) button for 6 sec.



Auto address starts

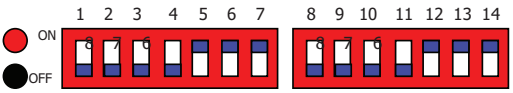
Auto address is in progress (max. 15 min.)

The number of indoor units is displayed for 30 sec.

(35 indoor units found)

Auto address process is finished.
Every indoor unit displays its address on wired remote controller and the 7 segment of main PCB is off.

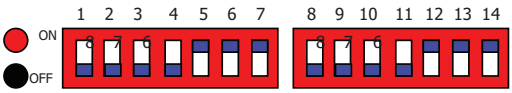
(b) Plus II

Name	Check point
Outdoor unit PCB DIP switch	◈ Dip switch Setting ◈ 

1. Main unit

No.	RESET	Function	Dip Switch
1		Standard Setting	All Off
2	0	Short Pipe length	No.1 ON Target high pressure down, target low pressure up
3	0	Long pipe length	No.2 ON Target high pressure Up, target low pressure down
4	0	Longest Pipe length	No.1, No.2 , ON
5	X	Refrigerant Auto Charging	No.1, No.2, No.7 ON
6	X	Refrigerant checking	No.1, No.2, No.7, No.14 ON
7	0	Forced Cooling operation	No.5 ON
8	0	Forced Heating operation	No.6 ON
9	0	Dry Contact	No.5, No.6 ON
10	0	Snow	No.8 ON
11	X	Forced defrosting	No.9 ON
12	0	Snow + Forced defrosting	No.8 , No.9 ON
13	0	Outdoor unit fan low static pressure compensation	No.12 ON
14	0	Outdoor unit fan low static pressure compensation	No.13 ON
15	0	Night low noise	No.12, No.14 ON
16	X	Pump down	No.10 ON
17	X	Forced Oil return	No.7 ON
18	X	Vacuum mode	No.11, No.14 ON

(b) Plus II

Name	Check point
Outdoor unit PCB DIP switch	◈ Dip switch Setting ◈ 

2. Settings of slave outdoor unit

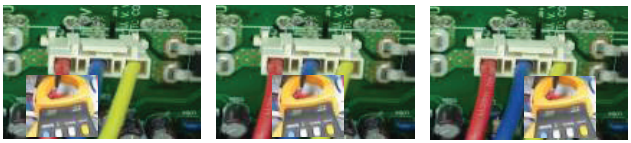
No.	RESET	Function	Dip Switch
1	0	Slave 1	No.5, No.7, ON
2	0	Slave 2	No.6, No.7, ON
3	0	Slave 3	No.5, No.6, No.7, ON

3. Settings of corresponding outdoor unit

No.	RESET	Function	Dip Switch
1	0	Inverter comp. back-up	No.3 ON
2	0	Unit back-up	No.4 ON
3	X	Pump out	No.10, No.14, ON

(b) Plus II

<table>
<tr><th>Name</th><th>Check location and method</th></tr>
<tr><td rowspan="3">Compressor</td><td>
Inverter compressor drive current (When compressor is starting)
- Driving current fluctuation of Inv. compressor should be less than 2A(Plus)

Check current of U phase Check current of V phase Check current of W phase
- Driving current fluctuation of Inv. compressor should be less than 2A(Plus II)

</td></tr>
<tr><td>
Coil resistance of compressor (When power is not supplied)
Check resistance of INV,constant compressor
INV, const. speed comp. resistance :INV COMP → 1.2Ω±10%(Plus), 0.35Ω±10%(plus II)
:Constant speed COMP : (U-V)1.96Ω/(V-W)1.91Ω/(U-W)1.99Ω±10%)

Resistance between U-W Resistance between V-W Resistance between U-V
</td></tr>
<tr><td>
Insulation resistance of compressor (when power is not supplied)
Check insulation resistance of constant compressor
(inverter compressor : a few MΩ↑,constant compressor : a few MΩ↑)

</td></tr>
</table>

(C) Plus, Plus II

Name	Check location and method
LEV	Check outdoor unit LEV

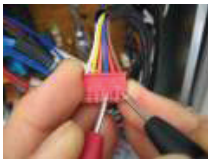
① - ③ : around 300Ω

② - ④ : around 300Ω

① - ⑤ : around 150Ω

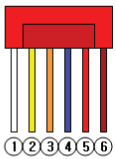
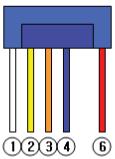
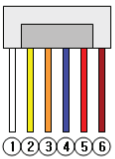
③ - ⑤ : around 300Ω

② - ⑥ : around 300Ω



④ - ⑥ : around 150Ω

Measurement of outdoor unit LEV coil resistance

Outdoor unit main LEV	Outdoor unit sub cooling LEV	Indoor unit LEV
5221A20001F ZEDM-AOYHLGK-6E-A [FUJIKOKI]	6141A20009J M12A-02 [PACIFIC]	- -
		
① - ③ : around 300Ω ② - ④ : around 300Ω ① - ⑤ or ③ - ⑤ : around 150Ω ② - ④ or ④ - ⑥ : around 150Ω	① - ③ : 104 ± 6Ω ② - ④ : 104 ± 6Ω ① - ⑥ or ② - ⑥ or ③ - ⑥ or ④ - ⑥ : 52 ± 3Ω	① - ③ : around 300Ω ② - ④ : around 300Ω ① - ⑤ or ③ - ⑤ : around 150Ω ② - ④ or ④ - ⑥ : around 150Ω